

# THE BRICKBUILDER

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## Hints on Architectural Acoustics.

BY HUGH TALLANT.

### PART II.

#### COMPUTATION AND PRACTICE.

THE first paper of this series discussed the relation between atmospheric vibration and the sensation of hearing, and gave reasons for believing that the acoustic qualities of an auditorium are dependent upon nothing more mysterious than its size, shape, material and contents, and the relative position of speaker and audience. All of these factors are known to the architect, and all except size are largely under his control. Theoretically, therefore, he is in a position to determine in advance the acoustics of an intended building, to account for the defects of an existing structure, and to make such corrections in design and arrangement as he may find necessary or desirable. The object of the present paper is to indicate how these theoretic possibilities may be practically realized. Accurate methods of computing loudness, distinctness, and quality of tone will be deduced and illustrated. The application of these methods to auditoriums of different sizes will be fully discussed, and means will be suggested whereby the most serious defects may be overcome without materially affecting the architectural treatment.

\* \* \*

**LOUDNESS.** In a properly designed auditorium there is, or should be, a free and unobstructed view of the stage. Conversely, there should be a straight path by which one small portion of the sound-wave produced by the speaker's voice can travel direct to the ear of each member of the audience.\* This portion of the wave will be called the "direct sound." Other portions which reach the hearer from time to time by deflection from the surrounding surfaces will be called the "deflected sounds." The latter are not infrequently audible after as many as two hundred deflections — that is, after they have traveled a mile or more, back and forth from wall to wall — and as the velocity of sound is only 1,200 feet a second, some of these deflected sounds may not reach the hearer until several seconds after the direct sound. In this way a single sound-wave may be heard as a prolonged tone, which gradually dies out as the last deflected sounds are absorbed by repeated impact.

As one-fifteenth of a second is the shortest perceptible

space of time, all sounds which reach the hearer within any particular fifteenth of a second combine to produce a single sensation whose intensity varies with the number and loudness† of the component sounds. For the present we are concerned with only the initial loudness — that is, the effect produced by the sounds which reach the hearer during the first fifteenth of a second. This initial loudness is dependent upon four factors, namely: the intensity of the original sound-wave, the number of sounds arriving within the first fifteenth of a second, the distance traveled by each of these sounds, and the amount of each absorbed by impact before reaching the hearer. It is now proposed to show how these four factors may be determined from data at the disposition of the architect.

The intensity of the original sound-wave is evidently an extremely variable quantity, dependent upon the calibre of the instrument by which the wave is produced and the particular modulation imposed by the speaker or musician. What concerns the architect, however, is not how loud the sound happens mathematically to be in any particular case, but whether it is *loud enough*. On a quiet lawn it is possible to converse with reasonable facility to a distance of nearly 200 feet, but here the conditions are exceptionally favorable, owing to the almost complete absence of commotion and sound interference. In an auditorium, on the other hand, there are always sound-eddies whose effect cannot be estimated, and also a certain amount of rustle among the audience. Under these circumstances the direct sound of the speaker's voice cannot be comfortably understood to a distance of much more than 50 feet unless it is reinforced by one or more deflected sounds. We shall, therefore, assume that the original intensity of the sound-wave is such that a single portion of it can be comfortably heard and understood to a distance of 50 feet from the speaker; and we shall designate by the letter *I* the intensity (whatever it mathematically may be) of a single direct sound at this distance. *I* is therefore the intensity corresponding to minimum efficient loudness, and any sound or combination of sounds which falls below this standard will not be comfortably heard and understood.

The number of sounds reaching the hearer within the

\* It is not necessary to complicate the discussion by the fact that humanity is blessed with a duplicate set of ears. Mathematically, no appreciable error is involved by neglecting this consideration, because any standard of loudness which may be adopted implies the simultaneous action of both ears.

† Intensity and loudness are not exactly equivalent terms. Equal inten-

sity corresponds to equal loudness, but an increase in intensity does not involve an equal increase in loudness. Two pigs under the traditional gate do not make twice as much noise as one. This psychological fact is, however, immaterial to the present discussion, which contemplates merely the establishment of an equality of loudness throughout the rear of an auditorium.

first fifteenth of a second can be determined directly from the architect's preliminary drawings. Fig. 4 represents the plan of an auditorium whose enclosing walls are WX, XY, YZ, and ZW. S is the speaker and A the hearer. The direct sound of the speaker's voice reaches the hearer by the straight path SA. The deflected sounds reach him by crooked paths such as SBA, SCDA, etc.

The most important of the deflected sounds are those which reach the hearer after a single deflection. The paths of these sounds may be laid out by the geometric construction shown in Fig. 5. In this drawing WXYZ is the plan of an auditorium, and HIJK a vertical section. The speaker and listener are located respectively at S and A on the plan, and at S' and A' on the section. Draw AC perpendicular to XY, and prolong it to D, making CD equal to AC. Draw DS intersecting XY at B. B is the point of deflection, and SBA the horizontal projection of the path of the sound deflected from the wall XY. The actual length of the path is evidently the hypotenuse of a right triangle of which the legs are SBA and S'E. Similarly the length of the path of the direct sound is the hypotenuse of a right triangle having as legs SA and S'E.

The diagram for two deflections is shown in Fig. 6 and for three deflections in Fig. 7. Similar geometric constructions can be applied to any number of deflections, but in an auditorium over 50 feet in average dimension, sounds which have been deflected more than twice rarely reach the hearer within the first fifteenth of a second, on account of the length of their paths. Of course sounds deflected from the rear wall are never available because they are likely to create sound interference. The total number of sounds which combine to produce the initial loudness is, therefore, distinctly limited, and for a rectangular auditorium can often be estimated by eye.

For curved surfaces the dia-

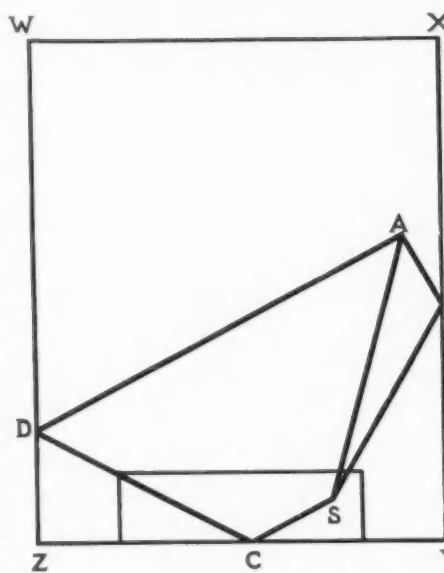


FIG. IV

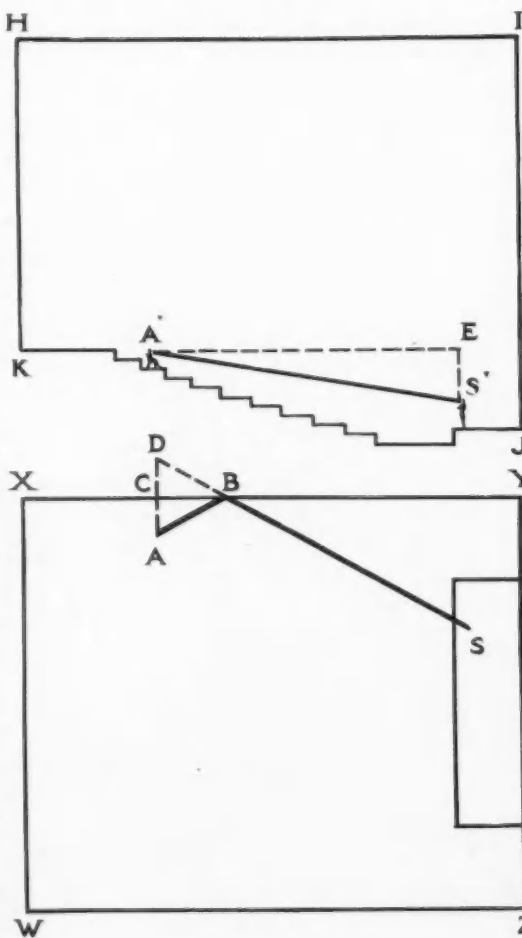


FIG. V

gram is apt to be complicated. The most convenient procedure is to lay out the sound paths as accurately as possible, and then correct them by slight alterations in direction until the angles of deflection become approximately equal to the corresponding angles of incidence. Frequently, however, the number of deflected sounds and the length of their paths can be estimated with sufficient accuracy without an exact diagram. Fig. 8 represents a section—not necessarily vertical—of an auditorium surmounted by a spherical dome. This section is taken passing through S, A and the center of the dome. SBCDEFH is laid out accurately, the angles of deflection with the tangents at B, C, D, E and F being made exactly equal to the angles of incidence. If FH falls, as shown, just beyond A there will usually be as many

sounds deflected to A in the plane of the section as there are points of deflection on the path SBCDEFH—in this

case five. The longest path traveled by either of these sounds is approximately SBCDEFH, and if this distance is not over 70 feet longer than SA, all these deflected sounds will reach A within less than one-fifteenth of a second after the direct sound. A complete discussion of all possible cases of curvature would far exceed the limits of this essay, but the reader will readily extend the method above suggested to pendentives, niches, and other architectural surfaces.

When the principal sound paths have been plotted, their length can be scaled from the drawing, and the sounds corresponding to paths not over 70 feet longer than the path of the direct sound\* may be selected as being the ones which combine with the direct sound to produce the initial effect of loudness.

The amount of each sound absorbed by impact before reaching the hearer can be determined from the same diagram. The points of impact are all located, and the architect is aware of the material of the deflecting surface at each point. He can therefore determine the

\*See the discussion of loudness in the first article of this series.

fractional part of each sound absorbed in each deflection by reference to the following table of approximate absorbing capacities, which, for convenience, is reproduced here from the first article.

Wall, floor and ceiling surfaces — such as wainscoting, wood or marble flooring, plastering, glass and masonry — absorb no sound.

Heavy curtains, rugs and carpets without batting absorb one-quarter of the sound.

Carpeting upon heavy batting absorbs one-half of the sound.

Cushions, ordinary upholstery, and heavy felting hung free from the wall absorb three-quarters of the sound.

The audience and very heavily upholstered furniture absorb all the sound.

The four factors of the initial intensity having been determined by the means above indicated, their combined effect can be computed by the following method:—

$I$  is the minimum efficient intensity and corresponds to the intensity of a direct sound at 50 feet from the speaker. As the intensity of sound varies inversely as the square of the distance from its source, the intensity  $i$  of any single sound which has traveled a distance  $d$  from the speaker will be

$$i = I \frac{2500}{d^2}$$

It does not make any difference whether the distance  $d$  is traveled in a straight or a crooked line, but in the latter case proper reduction must be made for absorption by impact. For this purpose, the intensity must be calculated to the first point of deflection and then reduced by the proportionate amount absorbed in the first impact. The distance which would have caused this total reduction must then be calculated and added to the distance between the first and second points of deflection. The intensity at the second point of deflection may then be calculated, further reduction made for the loss due to the second impact, and so on until the sound reaches the hearer. In this way the final intensity of each sound reaching the hearer within the first fifteenth of a second may be determined. These intensities may then be added together. If the total is as great as  $I$ , then the combined effect of the component

sounds will be *loud enough*. If the total is less than  $I$  the combined effect will *not* be *loud enough*. This procedure will be best understood from the following illustrative example.

The direct sound to a hearer seated 60 feet from the speaker, is reinforced by a deflected sound which travels 25 feet to a curtain, from which it is deflected 45 feet further to the hearer. Will the resulting sound be loud enough?

The intensity of the direct sound on reaching the hearer is

$$i = I \frac{2500}{60 \times 60} = 0.7 \ I$$

The intensity of the deflected sound at the point of impact is

$$i_1 = I \frac{2500}{25 \times 25} = 4 \ I$$

One-quarter of the deflected sound is lost by impact with the curtain, therefore after the impact

$$i_2 = \frac{3}{4} i_1 = 3 \ I$$

The distance corresponding to this reduced value is

$$d_1 = \sqrt{\frac{2500}{3} I} = \sqrt{833} = 29$$

Adding to  $d_1$  the 45 feet from the point of impact to the hearer we have

$$d_2 = d_1 + 45 = 74$$

Upon reaching the hearer the intensity of the deflected sound is

$$i_3 = I \frac{2500}{d_2^2} = I \frac{2500}{74 \times 74} = 0.46 \ I$$

The total intensity of the direct and deflected sounds upon reaching the hearer is

$$i_4 = i + i_3 = 0.7 \ I + 0.46 \ I = 1.16 \ I$$

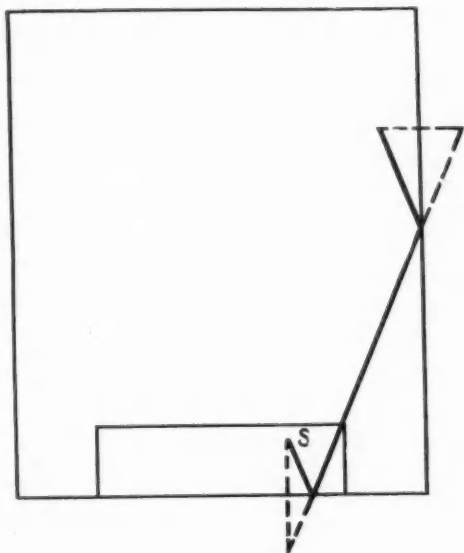


FIG. VI

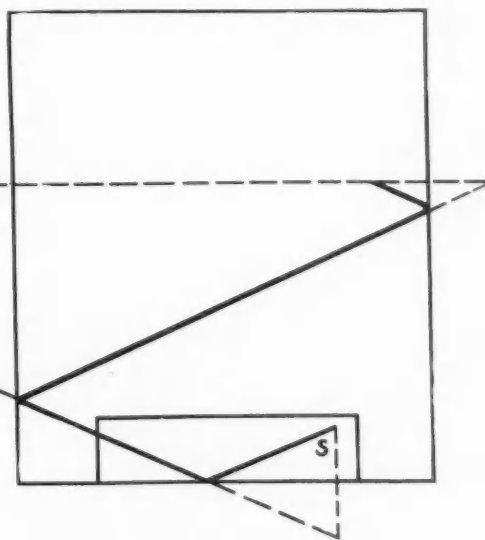


FIG. VII

As the total intensity is above the standard  $I$ , the combined sound will be loud enough.

This method of determining loudness appears somewhat formidable, but in practice it is rarely necessary to perform such a calculation as illustrated above. The number and intensity of the deflected sounds can usually be estimated by eye with sufficient accuracy, and even where computation is necessary it is usually simplified by the fact that the deflected sounds strike either among the audience, where they are wholly absorbed, or upon plaster, glass or wood, by which they are practically unaffected.

**DISTINCTNESS.** The conditions of distinctness are three: There must not be sound interference, excessive reverberation, or echo.

As explained in the first article, some measure of sound interference will always unavoidably exist in any enclosed space, but the effects are not likely to become a serious menace so long as no sound is deflected to the audience from the rear wall, that is, the wall opposite the speaker. The methods of accomplishing this result are not in the nature of computation and will, therefore, be discussed later on in connection with practical design and construction.

Reverberation is prolongation of tone produced by repeated deflection of the various portions of a single sound-wave. We have just discussed its initial intensity in connection with the question of loudness. The most convenient measure of the total amount of reverberation is the length of time that it remains audible after its original cause has ceased. Methods of computing this duration of audibility will be given in the discussion of quality of tone, but it may be said here that for musical purposes a calculated reverberation lasting 1.1 seconds gives the best results in a small auditorium. For speaking purposes the time of reverberation should be as much shorter as possible.

In an auditorium whose dimensions exceed 50 feet any reverberation is likely to result in indistinctness, because the first deflected sounds may not reach the hearer until one-fifteenth of a second or more after the direct sound. This will be better understood by referring to Fig. 9, which represents the plan of an auditorium of indefinite size. S is the speaker, whom we will suppose to be standing toward the side where the hearer at A is seated. One sound of the speaker's voice will travel direct to the hearer by the path SA. Four others will reach him after

one deflection by the paths SBA, SCA, SDA and SEA, and two more will arrive after a single deflection from the floor and the ceiling. But now suppose that the speaker happens to be standing on the front of a theater stage. The sound E will then be engulfed by the pro-

scenium arch. D must be intentionally destroyed to prevent sound interference. The sound which strikes the floor will be completely absorbed by the audience, and if the auditorium is much over 50 feet wide and high the sound B and the sound from the ceiling will arrive one-fifteenth of a second or more after the direct sound. The sounds of double and treble deflection will arrive even later, and consequently there will remain only the sound C to

break a perceptible interval of one-fifteenth of a second between the arrival of the direct sound and the arrival of the first deflected sounds. The chance that C may happen to be deflected to one side by some irregularity of moulding, or absorbed by some curtain fold is extremely large, and there is a serious risk that the first deflected sounds may not reach the hearer until so long after the direct sound as to produce indistinctness.

Theoretically, this contingency may be corrected by proper inclination of the deflecting surfaces. Practically,

the architect is seldom in a position to adapt his design so closely to theoretical lines; even if the labor of investigating and reconciling the conditions of some hundreds of seats were not almost prohibitive. Moreover the problem is altered with every change in the position of the speaker, and where, as in the case of a theater or opera house, the actor or singer has a considerable freedom of movement, the alteration in the mathematical conditions may easily become fundamental. As a rule, therefore, where the dimensions of an auditorium exceed 50 feet, it is safer to proceed by eliminating the reverberation altogether. It is extremely fortuitous that the extreme dimension to which reverberation can be conveniently utilized corresponds exactly

to the extreme distance to which the direct sound of a speaker's voice will readily carry. This coincidence makes it possible to draw a sharp dividing line between those auditoriums which may best be treated by utilizing the effects of reverberation and those where it is desirable to eliminate the reverberation by concentrating the deflected sound upon the rear of the house where the direct sound begins to need reinforcement.

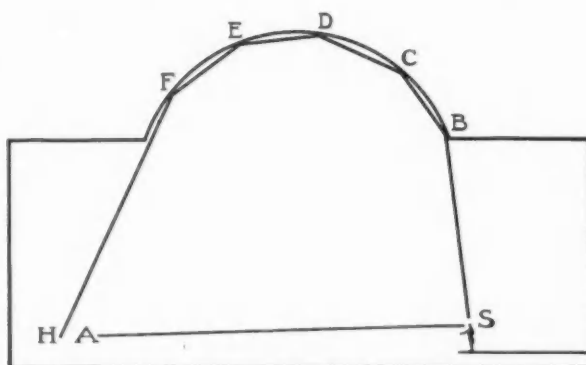


Fig. VIII.

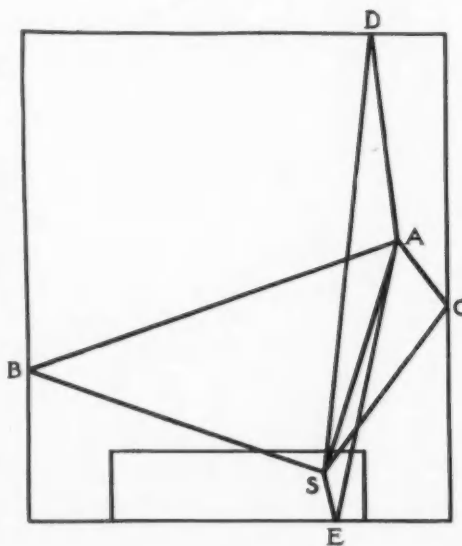


Fig. IX



## Partnership Agreements for Architects.

BY WILLIAM L. BOWMAN, C.E. LL.B.

ALTHOUGH this might be called the age of corporations, there are certain classes of business where copartnerships are still much favored. This is especially true in professional circles; nor is it to be wondered at, because where professional men join together for their mutual benefit, ordinarily there is not the same amount of capital involved, and thus the chief reason for the use of the corporate form, viz., the restriction of personal liability, does not have the same force and effect. Again, there is a great tendency among many of the States to restrict the powers of corporations, and in practically all, there are requirements necessitating the filing by foreign corporations of papers and the payment of certain fees before they can do business in another State. Further than this, an association of professional men usually calls for and requires much closer personal and social relations than are generally required in the ordinary business world. Even the enumeration of these few benefits and disadvantages show at a glance the reasons for the continued popularity of partnerships among professional men. It is for this reason, and because throughout legal literature it is difficult to find a special form of partnership agreement for architects, that this article, with its proposed agreement has been offered, with the hope that it may be of general aid in the formation of such partnerships in the future.

A partnership, being generally considered a contract relation is, of course created, limited, regulated and terminated, as between the parties themselves, by their articles of agreement; and under the law to-day partners may generally enter into any agreements which are not void as against statutory provisions or public policy. If the express contract does not cover all the duties and obligations as between the parties, then those which are necessary to be determined will ordinarily be implied, and such implication is to be collected and inferred largely from the conduct and general practice of the parties. On this account and because of the vagaries of human nature it is much safer and better in a partnership agreement, as in any other, to express clearly and concisely the various rights, obligations, duties, powers, etc., of the partners, so that there can be no possibility of any differences as to the meaning of the articles or of any words used therein.

Although it is generally assumed that anyone may become a partner, it should be remembered that an infant's contract of partnership is voidable at his option, even though during the continuation of the relationship he would have all of the rights and powers of a partner. Further, at common law it would seem that aliens who are subjects of nations which are at peace with each other may enter into partnership, but upon the breaking out of war between their respective countries the relationship is probably annulled.

No particular formalities are required upon entering into a contract of partnership, but it should be noted that under the Statute of Frauds an agreement to form a partnership in the future, which by its terms could not be, or is

not to be performed or begun within one year, or an agreement for a present partnership to continue for more than one year from its commencement, is void if not in writing. In the latter situation the oral contract, when acted upon and business conducted under it, is valid and binding at least during the time the parties were doing business under it.

In most branches of business and in most of the professions, specialization is to-day a *sine qua non* and it is affecting to a large extent the architectural profession. This profession often requires its business manager, its practical builder, its esthetic member, its interior decorator, and in some cases its politician. These various qualities are usually gathered in two or three partners, and the vacancies filled with salaried or commissioned men. Naturally this situation requires some consideration in the partnership articles.

The following agreement is suggested as a basis, which with changes made to suit the number of contracting parties, their general circumstances, local conditions and personal idiosyncrasies, should afford architects an opportunity to enter into partnership knowing exactly what their relations will be. After the important articles will be found short comments regarding the same and other possible or probable forms and changes which such conditions or circumstances may require, with reasons for the selection of the article recommended.

### ARTICLES OF PARTNERSHIP.

THIS AGREEMENT made .....19...  
by and between A. B., of ....., the  
first party, and C. D., of ....., the second party.

WHEREAS A. B. has for some time carried on the practice, profession and business of architecture, with offices in ..... City, State of .....  
....., aforesaid; and

WHEREAS the said A. B. has agreed to admit the said C. D. into partnership (in consideration of the payment to the said A. B. by the said C. D. of the sum of \$..... by way of premium),

Due to the fact that architectural partnerships are usually made by a well-known architect taking into his business some younger and unknown member of the profession, the preceding Whereas clauses cover such a situation. In case both parties have been practicing at different places or in the same places, such facts should be stated in similar clauses; or if a present partnership is admitting a third or fourth partner such facts should be set forth similarly. In other words, the Whereas clauses or preamble should express the present *status quo* and intentions of the contracting parties.

NOW THIS INDENTURE WITNESSETH, That in consideration of the mutual confidence of the said parties (and of the said sum of \$..... to the said A. B. paid by the said C. D. upon the execution of these presents, the re-

ceipt of which sum the said A. B. doth hereby acknowledge), they, the said A. B. and C. D., do hereby mutually covenant and agree to become and be partners in the practice, profession and business of architecture, upon and subject to the terms, conditions and stipulations expressed in the following articles:

I. The said A. B. and C. D. shall be partners in said practice as from the ..... day of ..... 19.., during their joint lives (or for a term of ..... years), unless the partnership shall be previously terminated under the provisions hereinafter contained.

One of the chief objects in a scheme of partnership to be kept in view is that the capital invested in the profession should remain intact and realizable in the event of dissolution by death or otherwise. In the case of architects the capital is practically synonymous with the good will and professional connection, and it is therefore very undesirable to introduce any article which may seriously affect the value of the good will or either partner's share in it, should it become necessary to liquidate the partnership. Besides this, the commonest objection to a partnership is the danger of disagreements between the partners, and it therefore should be made practicable for either party, at some sacrifice and with reasonable restrictions, to retire from the partnership, should he wish to do so. Bearing these facts in mind, and from general experience, it is to be recommended that the term of the partnership be made during the joint lives, subject to the restrictions which will be mentioned hereafter. In this connection it must be remembered that if both or all partners desire to dissolve they can do so at any time without considering the ways or means afforded by the articles signed.

II. The practice shall be carried on at ..... or at such other place or places as may be agreed upon, under the firm name or style of B. & D.

Although ordinarily architectural partners use a firm name containing some or all of the partners' names, care must be taken, if names other than the partners' are used or if the term "& Co." is used, to ascertain what the State statutes are regarding said use. In some States there are penalties connected with the use of certain names or words.

III. The lease, instruments, fixtures, materials, credits, patents, and all the other effects of said A. B., as set forth in the attached schedule marked I., heretofore employed and used by him in connection with his architectural business at the premises No. .... Street, in said City of ....., shall be transferred to the said partnership and be taken by it at an agreed valuation of \$..... (or shall be, at the date of the commencement of the partnership, valued by a competent assessor), which sum shall be considered as the amount of capital brought by said A. B. into said partnership. (The said C. D. shall, within one month from the commencement of the partnership, pay to the said A. B. a sum equal to ..... of the amount of such valuation, and the said lease and articles shall thereupon become the property of the partnership.)

If the incoming partner pays for his share of the actual assets of the old business under this clause, he must differentiate between this payment and the payment heretofore set forth, which would be for the good will of the profession.

The partner possessing the business will probably have in his offices and in use in the business, certain personal instruments, books, pictures, etc., the ownership of which

he will desire to retain. Due to that fact it has always been found expedient and desirable to list in a schedule everything which is to go to the partnership. This schedule must be full and complete, so that no question can ever arise upon this subject, which is quite a common source of trouble and disagreement between the partners. It is suggested that a valuation should be placed upon each article, so that if at any time a partner desires to purchase such article or if either partner should later retire and desire to take some articles with him, such a result could be reached with little or no difficulty on this score.

IV. The capital of the partnership shall be taken to mean and consist of the said lease, fixtures, etc., and effects enumerated in the last article and listed in the attached schedule as stated therein, and such further stock and effects as may from time to time be required for the efficient working of the practice, to be purchased with the consent of both partners, the cost thereof, and also such sums of money as may be, from time to time required, for the firm business, to be borne and contributed by the partners in equal shares (or in the proportions in which they are to share in the profits, as hereinafter mentioned). The capital is to be employed in the business of the partnership and no part thereof is to be drawn out by any of the partners, nor shall firm funds be drawn or used for anything but strictly firm business, without consent of all parties. Said partners shall be at liberty to draw out of the funds of the firm each month for their private expenses the following sums, to wit: A. B. \$ .....; C. D. \$ .....; but no moneys shall be drawn or paid to either partner without its equivalent share being drawn or paid to the other. The sums so drawn shall be charged against the partners respectively; and if at the annual settlement hereinafter provided for, the profits of any partner do not amount to the sum so drawn out in that year, he shall be charged and must pay interest on the deficiency at the rate of .. per cent per annum from that time until such excess shall be repaid to the said firm (or he shall repay such deficiency with interest at .. per cent at once to the firm).

This article considers one of the most serious problems in partnerships, namely, the power of the partners to deal with the partnership funds. In the ordinary articles it is usually provided that if any partner should overdraw his account he shall be charged interest upon the same. Such a requirement is of little solace to a partner, who finds that the other partner has drawn or is drawing money from the firm and charging himself legal interest when said partner has no funds or prospect of being able to re-pay such sums or borrow except from his share of the future profits of the firm. The writer has in mind an architect's firm where one partner acted as business manager and attended to all of the accounts, etc., while the other attended solely to the architectural end of the business. The managing partner in order to pay unusual personal demands began to borrow money from the firm, at all times keeping the books properly and charging himself with the amounts drawn, and at no time withdrawing more money than the firm could stand. When the yearly accounting was made, it was found that the borrowing partner had almost \$10,000 of the firm money, and since he had no personal moneys or income outside of the firm, the other partner found himself in a situation where it was questionable as to when, if ever, he would be able to get and have the use of his share of the borrowed money.

After a careful consideration of all probable means and

methods to avoid such a situation, it has seemed best to require absolutely payments to both partners or none at all. If any partner desires to leave such payment in the firm, as part of his accrued profits drawing interest as hereinafter provided, such action would be proper and would not affect the situation in the least.

V. An account shall be opened at the ..... Bank, at ....., in the name of the partnership, and within seven days from the commencement of the partnership the said A. B. shall deposit the sum of \$..... and the said C. D. shall deposit the sum of \$..... to such account, which said account shall not, without the consent of both partners, be at any time allowed to be less than \$..... All moneys received on account of the partnership by either partner shall be at once deposited to the said partnership account at the bank, and all checks drawn on account of the partnership shall be signed by both partners.

This provision of paying all moneys received into a bank has one indirect advantage, in that, if at any time the partners consider selling the practice, or any part thereof, said deposit would be regarded by the purchaser as valuable independent evidence upon which the premium would be based. Such banking, moreover, would be of great assistance in keeping the accounts of the practice and making the division of profits a simple matter.

The requirement that all checks be signed by both partners is unusual and might in some individual cases cause some inconvenience. Of course such a method would probably be too cumbersome if there were more than two partners. In the architectural profession about the only payments necessary are the salaries, monthly bills for rent, materials, etc., and the payments to partners. This being so, if any partner were to be absent for a short time it would be an easy matter for him to sign the weekly or monthly checks in advance. Experience has shown that the advantages of this requirement greatly outweigh any specific cases of inconvenience, and the protection thus afforded each partner and the firm, is in line with the constant effort in articles of partnership to allay any chances of suspicion between partners, and minimize the opportunities where one partner can act without knowledge and consent of the other. It might also be mentioned as an advantage that in cases of forgery it would be more difficult to forge two signatures than one.

VI. The partners shall be entitled to the net profits of the practice in equal shares (in the following proportions: A. B. .... per cent; C. D. .... percent), and they shall bear in the same proportion the expenses and losses arising in the said practice.

VII. Both partners shall employ themselves diligently in the said practice, and neither partner shall engage in any other undertaking or business requiring his personal attention; and in the event of either partner holding or obtaining any appointment or making any profit by consultation or as an expert, whether directly in connection with the said practice or otherwise, the net salary or net fees from any such appointment or profit from any such consultation or service as an expert shall be considered as part of the assets of the said partnership. Any unfinished work or business of either party shall be assigned to, and be completed by, the firm as partnership work, subject to the lien of the partner for work already done thereupon. Said lien shall be the proportion of the net profits on said work or business, less payments made, which the amount of time spent by the party bears to the

time spent by the partnership in completing the same (or shall be the same proportion of the net profit less payments made, as determined by the percentage of completion done by the party). Neither partner shall accept any personal professional appointment or office without the consent of the other partner.

A partner who has an established business is sometimes desirous of reserving for himself the emoluments of some appointment which he holds, as supervising architect or expert for some City or Board, but it is not reasonable or customary that he should do so. He will argue that this work must be done by him and cannot be deputed to the other partner, but on the other hand it takes time which rightfully belongs to the partnership. In case the partners have uncompleted work still on hand it should be completed by the partnership or by each one personally after the commencement of the partnership as partnership work. The remuneration which should go to the partnership and to the partners, should be in proportion to the services rendered by each, prior to the partnership, with perhaps an additional retainer to the partner who secured the business. This has proved to be one of the simplest and fairest ways of compensation under such circumstances.

VIII. Any legacy or gift not in direct return for professional services rendered, made to either partner exclusively, shall belong to that partner and not to the partnership account.

IX. Each partner shall at all times pay and discharge his private debts and liabilities and shall save the other partner and the partnership effects harmless from all debts and claims on his separate account; and neither partner shall, without the previous consent in writing of the other, become an assignor, endorser, guarantor or surety to or for any other person, or in any way use the firm name or credit, either directly or indirectly, except for firm business.

X. Each partner shall be liable personally to make good any loss occasioned to the partnership by negligence or misconduct on his part or by his failure to conform to these articles of agreement.

This article is bound to cause some hesitation on the part of certain partners, but it is believed that its influence will be very salutary. Of course architects will make mistakes. Whether such acts or omissions as are ordinarily called mistakes amount to negligence is a question to be determined on the facts. It may be argued that either partner may be negligent at various times and that when the losses from such negligence are considered, the firm will have suffered about equally from both partners. It does not seem that this presumption is a fair one, and it is believed that the retention of this clause is most essential.

XI. Such assistants and employees as may from time to time be needed for efficient practice shall be engaged by mutual agreement or consent; and, except in the case of flagrant misconduct, they shall be dismissed similarly.

XII. Each partner shall be just and faithful to the other in all accounts, entries, dealings and transactions relating to the said practice, and shall not use the name of the partnership, or deal with the property thereof, for other purposes than those of the said partnership.

XIII. Regular books of account shall be justly and fully kept of all the business and transactions of the partnership, and each of the partners and their respective



attorneys or legal representatives or authorized accountant shall have free access to inspect, examine and copy the same; and quarterly a statement or balance sheet shall be made showing the accounts receivable and payable, etc. On each 31st day of December during the continuance of the partnership, a full particular account in writing shall be made and taken of all the stock in trade, money, assets, credits and things belonging to and owing to said firm, and of all such other matters and things as are customarily comprehended in annual reports, and a just valuation and appraisal shall be made of all particulars included in such account which require and are capable of valuation and appraisal, and the interest of each partner in its capital and effects shall be ascertained and a balance sheet made out and corresponding entries made in its books of account, so that the true condition of the said firm may be thus actually known, to the end that the amount of net profits actually and without contingency earned may be from time to time credited on said books of account to the partners in equal shares (or in the following proportions, viz. to A. . . . per cent; to B. . . . per cent). In arriving at the amounts due upon said balance sheet there shall be charged to the expense account all expenses of the business and all losses and other charges incident to, or necessary to, the carrying on of the business. Either partner shall be at liberty to withdraw from the firm at any time the whole or any part of his share of accrued profits then ascertained and carried on his separate account. Each partner is to be allowed interest at the rate of 5 per cent (4 per cent) per annum upon the amount of accrued profits standing to his credit from time to time at each quarterly accounting on the books of the firm.

If any one partner is to receive an extra compensation as manager, or commission for the securing of business, a provision should be made in the above article for the payment of such moneys and the reduction of the gross profit by such amount in ascertaining the net or dividend profit. This at once raises a very serious question as to whether the partner who secures business should be given as a commission a certain per cent of the resulting net profits in addition to his share of the ordinary profits in the firm. In all professions it has become a custom to grant commissions for the securing of business. While this is necessary with salaried or other employees, it is a serious question whether such a provision is wise as regards partners. If the commissions are large a situation may be created where it would be to the advantage of a partner to seek business rather than attend to the architectural work and to the performance required by the contracts or work secured. Again, if only one partner as business manager is allowed commissions, a source of jealousy and trouble between the partners is created. Careful consideration of the situation and a study of cases where it has been discussed seems to lead to a recommendation that as between the partners no commissions should be paid. They are jointly interested in everything that the partnership does and that joint interest should be sufficient to call forth each partner's best efforts in the particular work or branch of the business entrusted to his care.

If no fixed amount is required to be kept in the bank as provided in Article V., then a provision should be here inserted requiring a fixed amount of capital which should be retained in the business, and which should be considered in determining the net or dividend profits. If a partner is allowed to borrow money by consent of the

other partner he should pay legal interest for such money while he receives under this article only 4 or 5 per cent for moneys left in the partnership. This, however, seems by experience to be sound business policy and much the better practice. If the business is large it may be well to have a semi-annual, rather than an annual accounting as herein provided, but that is a matter to be determined by the particular case.

XIV. If either partner shall desire to determine the partnership during the first year thereof, he shall be at liberty so to do, on giving two months' notice in writing to the other of his intention, and in such case, if A. B. be the partner giving the notice, he shall on the date of the termination of such notice pay to C. D. the sum of \$ . . . .; and if C. D. give such notice, A. B. shall at the time last mentioned pay to him the sum of \$ . . . . for his share in the practice, and shall at the same time pay to C. D. the value of his share in the capital of the partnership, as hereinbefore defined. And in such case C. D. shall be subject to such restraint upon practicing in or near . . . . aforesaid, as is contained in Article XXIV. of these presents.

Usually within the first year of their relationship partners ascertain and learn the differences and peculiarities of each other. If everything goes smoothly the first year, the chances are good that the partnership will last. With this in view and in order to still retain the force of Article I., this power of either partner to rescind during the first year of the partnership is granted.

There is serious diversity of opinion as to the sums which should be paid under this article. Some think that within the first year either partner should be allowed to retire, the only requirement being that each partner should as far as possible receive what he has contributed towards the partnership. Others recommend that the condition only works well provided the partner who gives notice to resume the *status quo* makes some considerable sacrifice; for example, if the notice is given by the vendor, A. B., he should pay to the purchaser, C. D., from 10 per cent to 30 per cent above the sum he received from him, whereas if it is given by C. D. he should receive back from 10 per cent to 30 per cent less than he paid, and in either event C. D. should be restrained from continuing to practice in the neighborhood. As has been well stated, it is usually the man who made a bad bargain who desires to withdraw, and why should he be penalized more than he already has been? On the other hand, he could hardly complain that he went into the partnership blindly, or without complete and full knowledge of its terms.

It will be noted that this is the only article granting power to determine the partnership, but if a partner at any time so desires there is no way to prevent his withdrawal, although the terms and conditions of such withdrawal can be settled and determined similarly as they are hereinafter contained in Articles XXII. and XXIII.

XV. The second party, at any time before the termination of the . . . . year of the partnership, shall have, on giving to the first party three calendar months' previous notice in writing, the option of purchasing a further share of the business, so that his interest may equal that of the first party. The purchase price for such further share shall be the sum of \$ . . . ., to be paid in cash at the time of the purchase.

This article should only be used in case the purchaser, C. D., buys less than a one-half share, and it is only fair to allow him to purchase up to one-half after two



ten years, according to the circumstances. The purchase price should be based upon the original valuation and not upon the valuation of the partnership practice. This, because an increase in receipts may be as much or more to the efforts of the purchaser as to those of the old partner. An incoming partner will naturally be anxious to increase his share in the business, while the vendor will just as naturally try to retain as much interest for himself as possible, and thus the latter usually endeavors to put off the time of equal joint association as long as possible. One fair method sometimes employed, which obviates this difficulty, is to give the junior partner the option of increasing his share to one-half at any time after a given number of years, or sooner, if at the end of any year it shall be found that the junior partner has during such years done as much work, as represented by the fees earned, as the senior partner has done.

XVI. Either partner may, on giving to the other six calendar months' previous notice in writing, sell his share in the said practice (at any time after the . . . . . day of . . . . ., 19 . . .). The other partner shall, during the pendency of such notice, be precluded from giving a similar notice on his own behalf, but he shall have the option (to be declared in writing not less than three calendar months before the expiration of the notice) to purchase, as from the date of the expiration of the notice, the share of the partner so retiring for a sum equal to . . . . . the gross annual receipts from such share, as shown by the average for the last three years immediately preceding the expiration of such notice, or since the partnership if less than three years; such sum to be paid in cash at the date of purchase. In the case of the remaining partner declining or failing to declare his option so to purchase, the retiring partner shall be at liberty to sell his own share in the practice and in the capital to a properly qualified man, who shall (but subject to the approval of the remaining partner, which is not to be unreasonably withheld) be admitted to partnership by the remaining partner, subject to obligations and with rights similar to those of the retiring partner at the time of sale. Such purchaser shall execute a proper deed of accession binding him to observe the stipulations and conditions contained in these presents, so far as the same shall be applicable, and such other provisions as may be necessary or proper to effect the intentions herein expressed, and any difference as to the form or contents of such deed may be referred to arbitration. (Provided always that the said A. B. shall not sell his share in the practice until after the expiration of the . . . . . year of the partnership and C. D. shall not sell his share until after the expiration of the . . . . . year of the partnership.) And if a new partner be admitted under this clause, the continuing partner shall not be at liberty to sell his share until after the expiration of two years from such admission. If either partner shall die before the expiration of any notice to sell given under this clause, such notice shall be void.

This article changes one of the usual and fundamental rules of partnership by allowing a partner to sell to another person. Subject to the restrictions therein governing such a sale, it is believed that in general the results reached can only be beneficial.

One of the difficult questions which arises, however, is the date at which either party is to be allowed to sell, and naturally this should vary, depending upon whether

the one seeking to sell is the old or the new partner. As regards the price at which the remaining partner shall have the option of purchasing, it should be the same rate of purchase as the original purchase price, but based upon the average cash receipts for say three years immediately preceding the retirement. Of course, if the new partner has been taken in by the old partner with a view that the latter could retire at some time in the near future, this article should be changed so as to prevent the new partner from having any power to sell, but instead he should have the right of buying the senior partner out at any time after a fixed number of years.

XVII. In the event of either partner absenting himself from the practice or becoming from any cause incapacitated from performing his fair share of work therein for more than four entire days in any three consecutive calendar months, he shall, if required in writing by the other partner so to do, provide at his own expense a competent qualified person as substitute. Provided always that nothing herein contained shall be taken to imply a right in either partner to absent himself to the neglect of his duties in respect of the practice.

XVIII. In the event of any absence or incapacity of either partner continuing (except with the written consent of the other partner) for more than six consecutive calendar months or for more than 200 days in any two consecutive years, or if either partner shall become lunatic (or if either partner shall commit any breach of the articles herein contained and on his part to be observed and performed, or shall do or suffer anything whereby the interests of the partnership shall be in danger of being seriously injured), it shall be lawful for the other partner by notice in writing (such notice in the case of breach of these articles or misconduct to be given within fourteen days after the partner giving the notice has knowledge of such breach or misconduct) to determine the partnership, but without prejudice to any remedies of the partner who gives such notice. And if the partnership shall be so determined as aforesaid or by reason of a partner having suffered his share to be charged or of the bankruptcy of a partner, or shall be dissolved by the Court on account of the lunacy, incapacity, absence or misconduct of a partner, then and in every such case the partner through whose lunacy, incapacity, absence, misconduct, bankruptcy or other default the determination or dissolution of the partnership shall have been caused, shall for the purposes of these presents be deemed to be dead as from the date of such determination or dissolution, and his share and interest in the practice as from such date shall (*mutatis mutandis*) be dealt with as hereinafter provided in the event of the death of a partner, the legal personal representatives of a deceased partner being, if necessary, taken to mean and include a surviving partner, or his committee, or trustee, as the case may be. Provided always that in case the dissolution or determination has been caused by the misconduct or breach of one partner the other partner shall not in any event be bound to purchase his share.

This clause deals with several of the serious and difficult questions in partnership, as to what shall be done in cases of lunacy, misconduct or bankruptcy of a partner, and it seems that this provides a satisfactory and fair method of overcoming such difficulties.

XIX. In the event of the partnership being deter-

mined by the death of A. B. in the first year of the partnership, C. D. shall purchase (or have the option of purchasing) the share of A. B. for the sum of \$....., and if in the second year of the partnership C. D. shall purchase (or have the option of purchasing) such share for the sum of \$....., and if in the third year of the partnership C. D. shall purchase (or have the option of purchasing) such share for the sum of \$..... In the event of the partnership being determined by the death of C. D. during the first three years of the partnership, A. B. shall purchase (or have the option of purchasing) his share for the sum of \$..... If the partnership shall be determined by the death of either partner occurring after the end of the third year of the partnership, the surviving partner shall purchase (or have the option of purchasing) the share of the deceased partner for a sum equal to .....times the average gross annual receipts from such share for the three years last past immediately before the date of the partner's death. (Any option to purchase under this clause shall be declared by the surviving partner within fourteen days after he has knowledge of the death of his partner.)

It will be noted in this article that the survivor is here bound to buy, and experience has shown that this is much better practice than merely granting him an option to buy, because in the latter case the representatives of the deceased are largely at his mercy, for without actually refusing any purchaser whom they may bring forward, he may so deport himself or misrepresent the practice that no one would care to join him in partnership; and he would eventually obtain the share for nothing, or at any rate upon his own terms, although an attempt to remedy this has been made by the latter part of Article XXII. Regarding the fixing of the price to be paid by the survivor, it should, in consequence of the absolute requirement of buying, be made moderate. Due to the fact that these articles are written assuming A. B. to have a fixed practice with a certain clientele, and that the new partner is a younger man starting out, it would seem fair to allow different valuations each year up to and including the third year of the partnership. If, however, the two prospective partners are older architects with about an equal valuation of their individual practice, there will be no difference in the purchase price at these various times. Naturally it is necessary that each case should be considered on its own merits, as circumstances may materially alter the amounts which should be payable in the event of death.

XX. The practice shall become the property of the surviving partner as from the date of his partner's death, subject to the payment from the same date of all outgoings. The surviving partner shall pay the purchase-money in cash within one calendar month of such death unless security approved by the legal personal representatives of the deceased partner shall be given by the surviving partner, in which case the surviving partner shall pay the purchase-money as to one-fourth within one calendar month from his partner's decease and as to the remaining three-fourth parts thereof within six, twelve and eighteen calendar months respectively from such decease, with interest at the rate of 4 per cent per annum on the amount for the time being outstanding.

If the survivor buys, the price not only should be moderate, but the terms of payment should be easy, though they should be so arranged that the executors of the deceased partner should have the best available security that the money would be paid in due course;

otherwise it would be possible for the survivor to sell or within a short time after his partner's death and elude payment. If the survivor cannot pay cash or give satisfactory security, then his proper course is to take in another partner, who will provide the necessary capital.

XXI. Any purchase of a share or part of a share of the practice under these presents shall not (unless otherwise specially provided) include any book debts of the partnership or of either partner. And in the event of either partner or any hereafter admitted partner purchasing the share or part of the share in the practice of the other, the purchasing partner shall at the same time purchase a corresponding share in the capital of the partnership (not including book debts) for a sum to be agreed upon or determined by valuation and to be paid in cash at the time of such purchase.

XXII. In case of any dissolution of the partnership (otherwise than by effluxion of time) the surviving or continuing partner shall pay and liquidate all partnership debts and liabilities and shall, in accordance with the customary dealings, get in and collect all book debts of the partnership, and shall render an account thereof quarterly and at the same times pay the share of the outgoing partner therein to him or his representatives, as the case may be.

XXIII. Subject to the provisions of these presents and save as herein otherwise provided, upon the determination of the partnership, a general and final account in writing shall be made and taken of all the moneys, credits, property (other than the good will and connection of the practice), effects, debts and liabilities of the partnership up to the time of the determination thereof, and the said moneys, credits, property and effects, or the proceeds thereof, shall, after discharging or providing for the debts and liabilities of the partnership, be divided between the partners or their representatives in the proportion in which they shall at the date of such determination be entitled to the net profits of the partnership.

XXIV. If the share of either partner in the practice shall be sold or taken over at a valuation under any clause of these presents, the outgoing partner shall not at any time thereafter (or within ..... years from the date of such sale) exercise or carry on or be directly or indirectly interested in exercising or carrying on, upon his own account or in partnership with or as assistant to any other person, the practice, profession or business of architecture at ..... aforesaid, or at any place within a radius of ..... miles therefrom. And should the outgoing partner so practice or assist any other person in practicing within the limits aforesaid, or in any way violate this provision, he shall forthwith pay to the remaining or continuing partner the sum of \$..... (for every month or part of a month during which he shall violate this provision), as ascertained and liquidated damages and not by way of penalty.

This article raised at one time a serious question as to how far you could restrict a person from acting professionally or from carrying on business, but the law now seems to be almost unanimously settled that a person can by agreement preclude himself from doing certain things within a certain territory. In ordinary architectural practice it would seem generally sufficient to restrict the outgoing partner within the city or town in which the partnership has had its principal place of business.

Although there might be cases where such restriction would need to be enlarged. Such clauses are not especially in favor with the architectural practice to-day on account of the fact that an architect has his personal clients, who will deal with him under all circumstances whether he is alone, in a partnership, or in a corporation. On the other hand, a selling of the business necessarily involves the selling of the good will, which means in turn an introduction of one's own friends and clients upon the theory that the purchaser is capable, and able to take the place of the seller. With this consideration it would seem that there should be no serious objection to such an article.

XXV. Any notice to be given to a partner or his representatives under the provisions of these presents shall be deemed to have been sufficiently given if handed to such partner or addressed to him or to his executors and sent by registered letter to his last known address, or handed or sent to any one of his executors or administrators or his committee or trustee, as the case may be.

XXVI. Either of the parties hereto shall, at the request and at the expense of the other, execute any papers and do any deeds and things reasonably necessary to carry out the provisions of these presents or to render the same more easy of enforcement.

This is a most important article, because notwithstanding how careful the partners are, there are bound to be certain things forgotten during the carrying on of the business or at a time of dissolution or of retirement. One such situation arises where, after dissolution or retirement, it was intended that the continuing partner should have the use of the firm name. Many state statutes require under a severe penalty the consent by the retiring partner, to such use and since such consent should be in writing to be safe, it could be secured pursuant to the requirements of this clause.

XXVII. If during the continuance of the partnership or at any time afterwards, any dispute, difference or question shall arise between the partners or any of their representatives touching the partnership or the accounts or transactions thereof, or the dissolution or winding up thereof, or the construction, meaning or effect of these presents or anything herein contained, or as to any valuation herein provided for, or the rights or liabilities of the partners or their representatives under these presents, or otherwise in relation to the premises, then every such dispute or difference shall be and hereby is referred to the arbitration and final decision of . . . . . or, in the event of his death or unwillingness or inability to act, of . . . . . or in the event of his death or unwillingness or inability to act, of a person to be appointed on the request of either party by the Secretary for the time being of the American Institute of Architects, and the award of such arbitrator shall be final and binding upon both parties. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof or direct the same to be taxed as between the parties, and shall be borne by whom, and to whom and in what manner the same shall be borne and paid.

The above clause affords the usual appeal to arbitration which is so common to-day in all contracts. If the partners entering into partnership live in or near Chicago, it is probable that they will desire to use the arbitration clause provided by the Chicago Architects'

Business Association, which provides for the selection of the arbitrator by the President of said Association. This Association apparently has established an arbitration committee, and it seems reasonable that what has been done by the architects in Chicago will be followed by those in other large commercial centers. Any readers who are interested in this question of arbitration and its legal force and effect are referred to the arbitration clauses and discussions in the transactions of the American Society of Civil Engineers, Vol. LXVII., page 438, under the title, Agreements for Building Contracts.

If there are more than two partners, then as regards all questions, differences or disputes between the partners arising in the business, management or regulation, the above article should be changed so as to make the determination of the majority in number of the partners final and conclusive on the others, allowing, however, an arbitration under certain conditions of notice, and providing the differences are serious enough to require such arbitration.

XXVIII. In all cases where building contracts, operations, repairs, etc., are to be done to the satisfaction of B. and D., architects, it is agreed that this shall require the satisfaction only of the partner having said work in charge, whose personal decision shall be final and binding upon the partnership without the consent or approval of the other partner.

This article deals with one of the most serious practical questions raised in architectural partnerships. While the writer doubts its additional legal force, yet it is hoped that it may aid a very troublesome situation. The writer has never seen any such clause and it is, so far as he knows, purely a creation of his own. To-day practically all building agreements in the English language require the work to be done to the satisfaction of the architects. When the architects are a partnership or corporation, the builder finds to his sorrow that in many instances he is trying to serve several masters. This is unfair to him and he should at the outset be appraised as to the exact person and architect or which partner he is to take his directions from, and to whose satisfaction the work must be done. Firms of architects have been known to carry on work under the personal inspection and supervision of a junior partner or hireling and when time for the final inspection has come another partner appears on the scene, condemns materials and work done, much of which may have been furnished or done under express directions; then certificates which are condition precedent to payments are withheld and the contractor is required to do his work over again to please the new architect. Whether this clause will accomplish what it has been designed to do is questionable, but it is felt that it is a step in the right direction, and if it becomes general in architects' partnership agreements and is known by builders to be there, it will relieve much of the present day friction between architects and builders and at the same time will free architectural firms from a usual and often fair criticism of their methods.

IN WITNESS WHEREOF the said A. B. and C. D. have hereunto set their hands and seals the day and year first above written.

..... (L.S.)  
In the presence of

..... (L.S.)

While these proposed articles of agreement make a much longer contract than is customary, yet there are many clauses which have not been considered and which are common and usual in such agreements. The writer calls attention to the following so that prospective part-



ners may have them in mind, i.e., power in the majority of partners to force retirement upon a partner after notice and payment; power to dissolve the partnership at any time with provisions regarding the same; power to introduce sons or relatives into the partnership; power of surviving or continuing partner to sign the firm or partners' name to any necessary papers, etc.; in case an option is given under Article XIX. instead of requiring a purchase, then the representatives of the deceased partner should be given an option to sell the deceased partner's share to a properly qualified person; provisions regarding vacations, etc.

This paper would hardly be complete without some consideration as to the relations of the separate partners with the firm. While most people to-day consider the partnership or firm as a separate entity from the partners, which is proper in the business relations, yet it is strange to note that there are occasions when the individuality of the firm is neglected. Take a specific instance, which is probably one of the most common in all partnerships. The partnership has done certain work to the extent of \$1,000 for X., a client of A. B. The latter owes this client money on certain personal debts and desires to offset the personal debts by the partnership account. He thereupon goes to C. D. and says, "I will take over X.'s account and you pay yourself your share of the profits." Assuming that the partners share equally, C. D. thereupon draws a partnership check to himself for \$500, and the indebtedness of X. to the firm is canceled. At first blush this situation would seem to be fair between the partners, but as a matter of fact both the firm and C. D. lost on the deal. The firm lost not only the \$500 paid to C. D. but the full account of the \$1,000, making a total of \$1,500, which should have been equally divided between A. B. and C. D., so that under these circumstances A. B. gained \$250 and C. D. lost the same amount in the transaction. While such a method of transferring accounts is rather unusual and could hardly happen where there is a regular bookkeeper, yet it has been employed and will be in the future. This is the kind of an advantage which a shrewd partner might take over a careless or unthinking one. Such a situation also shows that the dealings must be made by each partner with the firm and not between the partners to the exclusion of the firm.

In view of the warning and suggestion given in the foregoing paragraph, and although in the business world a partnership is considered as a separate person or entity, it must be borne in mind that the legal situation is exactly the reverse, and that a firm as such, is not regarded as having any legal existence apart from the members composing it. This is the rule at common law, though there are a few state statutes legalizing the business theory.

In conclusion, I desire to impress upon prospective partners that, in accordance with the common law rule, what is called the property of the firm is the property of the individual partners; what are called the debts of the firm are the debts of the partners; and each individual partner is liable to the creditors of the firm for the whole amount of every debt due therefrom, without reference to the proportion of his interest or the nature of the articles of agreement.

## Competition for a Small Brick House.

### REPORT OF THE JURY OF AWARD.

THE mandatory conditions of the program for this competition "A Brick House, the cost not to exceed \$4,000.00," necessarily made the problem rather a difficult one if the condition as to cost was to be met, and it was so recognized by the jury who approached their part of the problem in rather a skeptical frame of mind as to the ability of any one to produce a design which should meet this condition and at the same time have the charm and good planning which should be demanded in a competition of this kind. It was recognized by the judges that in the vast majority of competitions for low priced houses held within the past few years apparently no attention had been paid to the condition as to cost, whereas in practice in houses of this class it is a vital factor, a small variation from the limit set being of serious importance to the prospective builder of a moderate cost house.

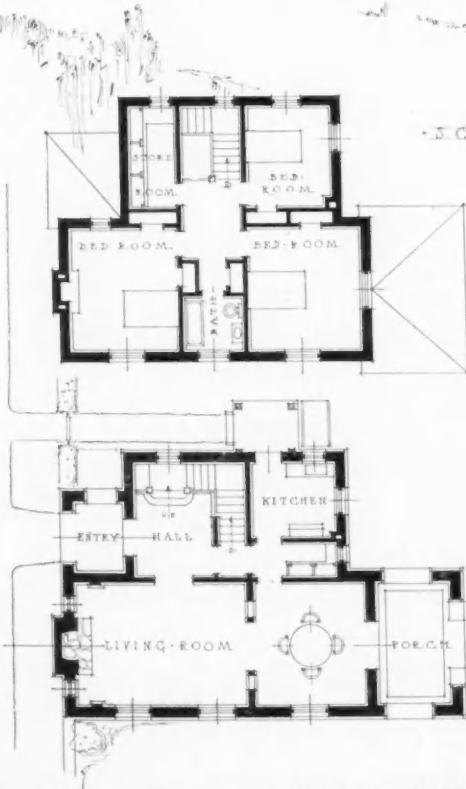
After consideration \$5.00 was agreed upon as a fair price per square foot, though it was recognized as rather low for building in the immediate vicinity of the larger cities. This set a limit of 800 square feet to the allowable area. While this simplified the work of the judges in considering the three hundred and twelve designs submitted, they were disappointed in the large number which were necessarily ruled out of competition; nevertheless it was felt that after this test the best designs remained for further consideration. The problem necessarily demanded great simplicity both in plan and elevation and its solution a careful discrimination as to what should, and what should not be included in a house of this class. The conditions of the program made the plan of secondary consideration; their practicability and general arrangement were however steadily kept in mind.

**FIRST PRIZE.** A very able and charming design with good details, a design which would be most interesting if executed. The plan is one of the best arranged and effective of those submitted.

**SECOND PRIZE.** A very simple and characteristic brick design of the Colonial type which would depend for its effectiveness very largely on the texture of brick and method of laying. The cornice is unfortunately weak. The plan however is excellent and the design one, on the whole, which gives the greatest promise of being built within the appropriation.

**THIRD PRIZE.** A simple, straightforward design economical in plan and construction. While the second floor has been sacrificed by the method of roofing the gain in economy is justified by the results on the exterior. The second floor would be improved if there were but one room over the living room—three bed rooms being all





SCALE OF PLAN

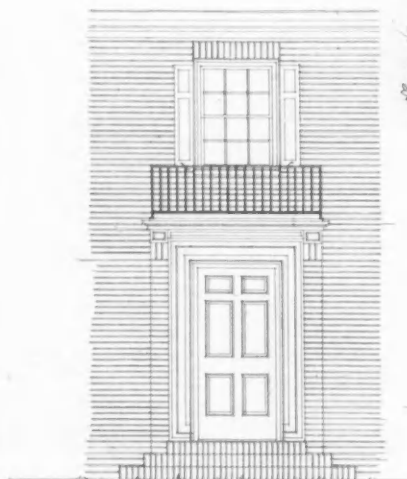


COMPETITION FOR A BRICK HOUSE  
TO COST FOUR THOUSAND DOLLARS

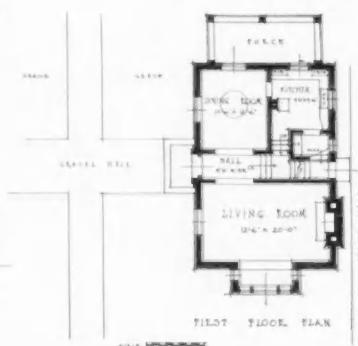
FIRST PRIZE DESIGN.  
Submitted by William Boyd, Jr., Pittsburg, Pa.

THE BRICKBUILDER COMPETITION FOR A SMALL BRICK HOUSE.

4000 DOLLAR  
BRICK HOUSE  
BRICKBUILDER COMPETITION  
SUBMITTED BY



SKETCH OF ENTRANCE

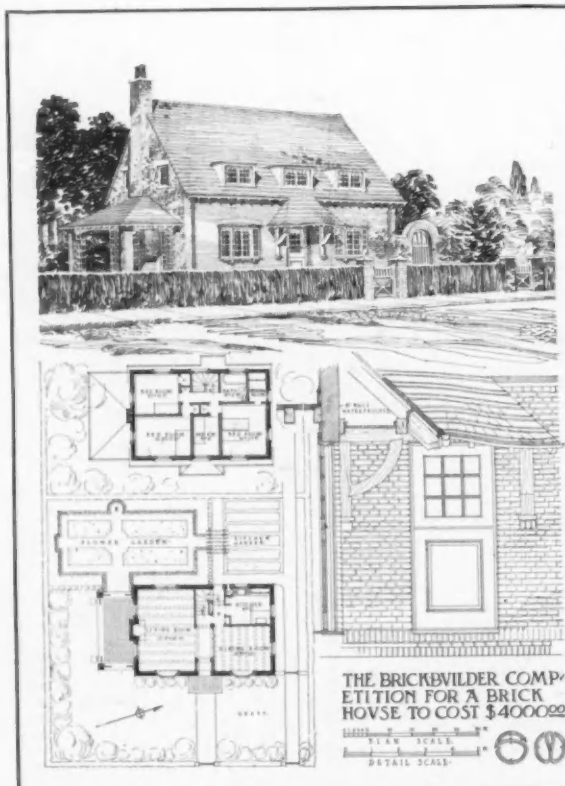


FIRST FLOOR PLAN

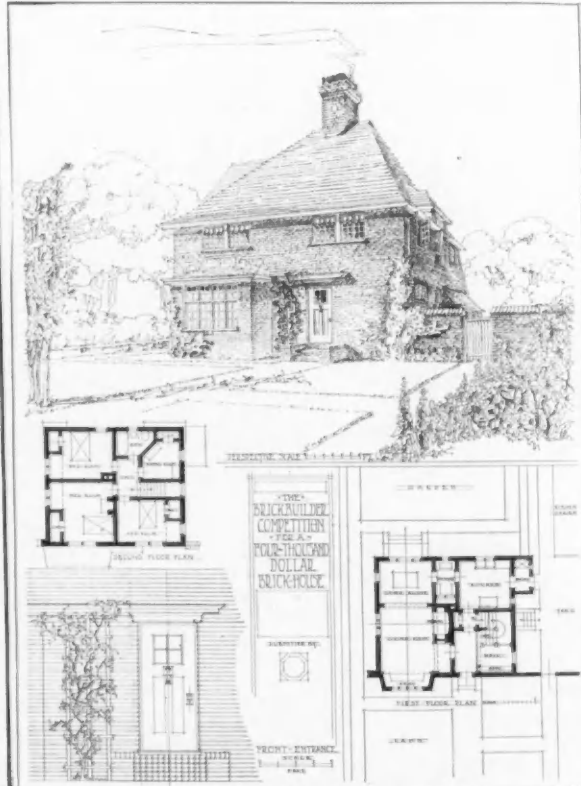


SECOND FLOOR PLAN

SECOND PRIZE DESIGN. Submitted by Francis D. Bulman, Boston, Mass.

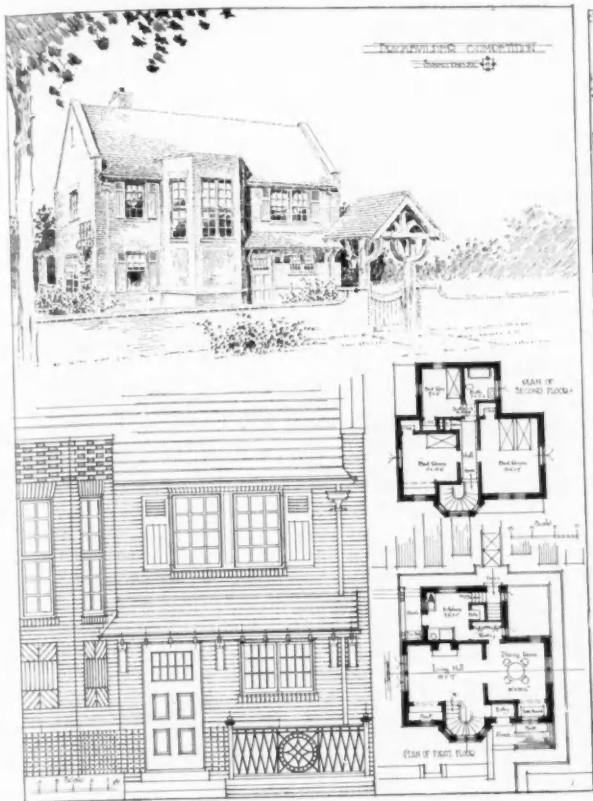


THIRD PRIZE DESIGN.  
Submitted by Steward Wagner, New York City.



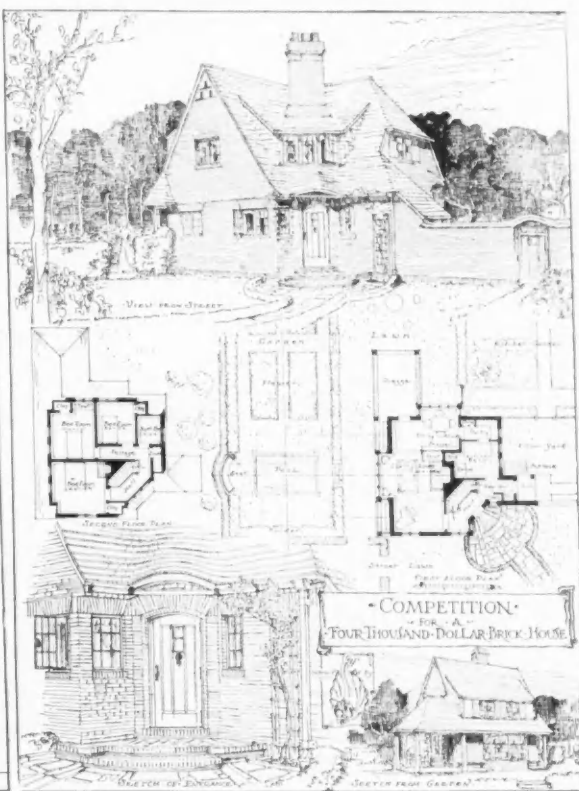
FOURTH PRIZE DESIGN.  
Submitted by A. R. Nadel, Boston, Mass.

THE BRICKBUILDER COMPETITION FOR A SMALL BRICK HOUSE.



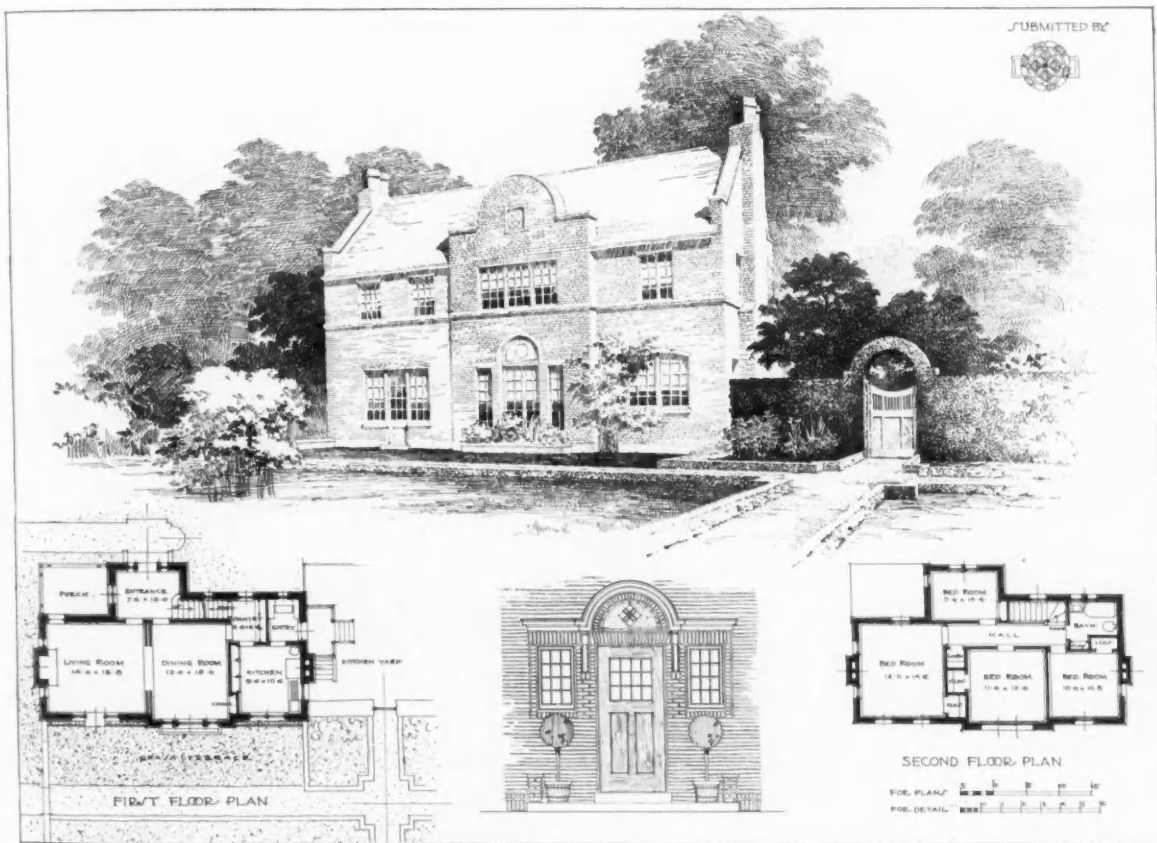
FIRST MENTION DESIGN.

Submitted by C. Edward Arnemann, Weehawken, N. J.



SECOND MENTION DESIGN.

Submitted by D. D. Barnes and W. A. Neate, Boston, Mass.



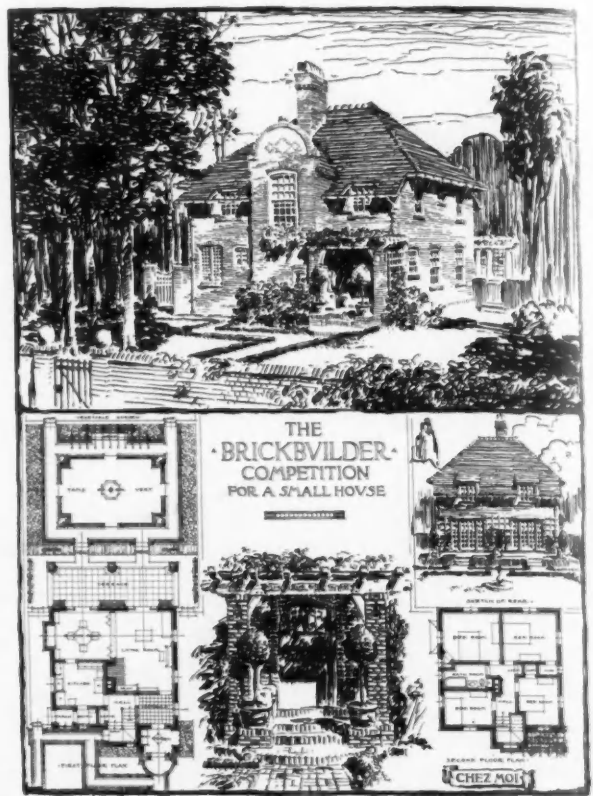
THIRD MENTION DESIGN. Submitted by Charles F. Hogeboom, Brooklyn, N. Y.

THE BRICKBUILDER COMPETITION FOR A SMALL BRICK HOUSE.





FOURTH MENTION DESIGN.  
Submitted by Albert G. Hopkins, Boston, Mass.



FIFTH MENTION DESIGN.  
Submitted by Charles S. Schneider, Cleveland, Ohio.

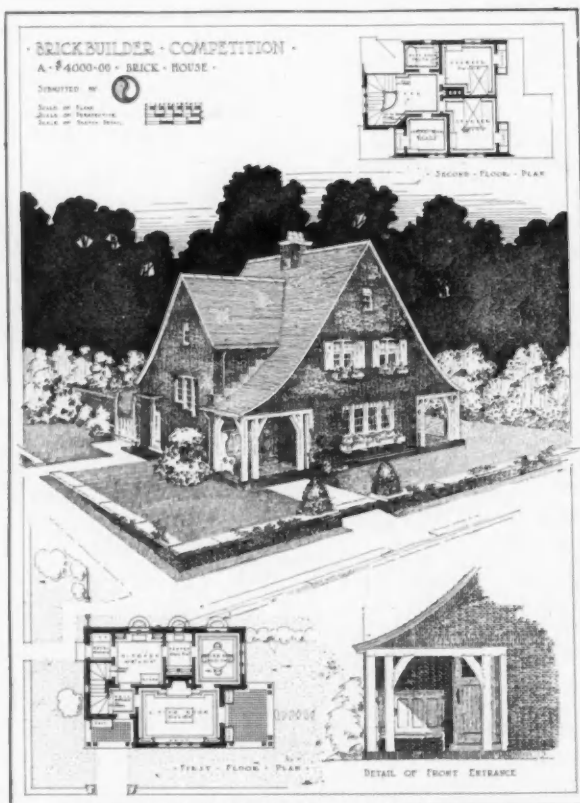
that could reasonably be required in a house of this character.

**FOURTH PRIZE.** A design rather reminiscent of English work and one which would probably be even more interesting in execution than in the drawing.

**FIRST MENTION.** A good brick design which is injured by the large scale of the openings in the stair bay, while the composition is hurt by the importance given to the entrance gate.

**SECOND MENTION.** An interesting and unusual plan. The garden elevation is the simpler and the better of the two given.

**THIRD MENTION.** A very interesting treatment beautifully presented. The details are good but would add materially to the cost of construction.



SIXTH MENTION DESIGN.  
Submitted by Howard A. Goodspeed, Boston, Mass.

**FOURTH MENTION.** A design which on account of its great simplicity is a good solution of the problem; one which would again depend largely for its effect on the kind of brick work and method of laying.

**FIFTH MENTION.** This design was felt to be rather too much broken up and lacking in the simplicity requisite for a house of this class, though interesting in its effect.

**SIXTH MENTION.** This design is the most picturesque of all the designs considered. It is, however, hardly fitted to be carried out entirely in brick.

BENNO JANSSEN,  
HOWARD K. JONES,  
FREDERICK A. RUSSELL,  
FRANK E. RUTAN,  
ALBERT H. SPAHR,  
*Jury of Award.*



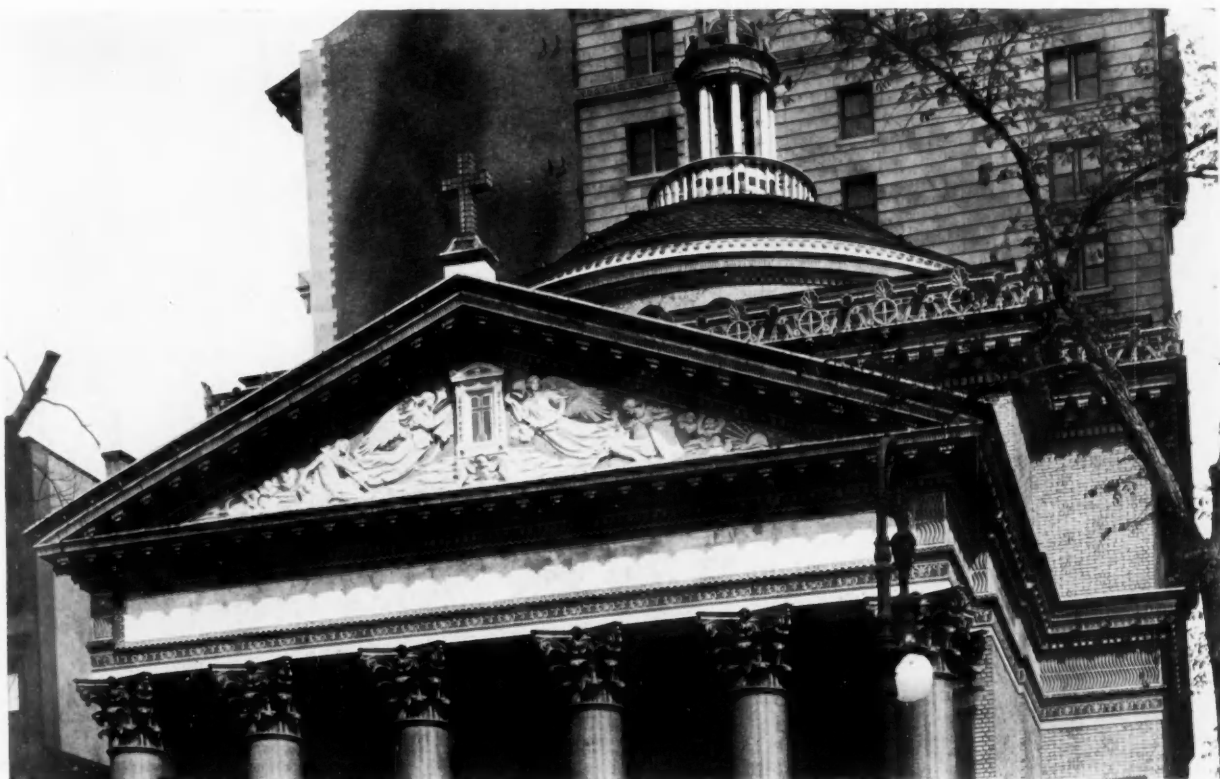
## Editorial Comment and Miscellany.

### MASONIC TEMPLE, COLORADO SPRINGS, COLORADO, PLATES 90, 91.

AN EGYPTIAN character has been observed throughout this entire building. The external walls are treated in buff brick, with trimmings of terra cotta, the color of which is brought into harmony with the tone of the brick. The interior of the lodge room is executed in plaster with a general tone corresponding to that of weathered Caen stone. The capitals of the columns together with the other enriching details are picked out in the characteristic colors of Egyptian work as exemplified in former records of this style which have been carefully studied. In the center of the east wall is

ing in the usual manner is an excessive burden on the abutting property. The volume and character of traffic in the residence sections also is such that there is no need for the width of pavement provided when the space between the curb lines is entirely improved. To meet this situation, Mr. L. C. Kelsey, formerly City Engineer of Salt Lake City, adopted a scheme for dividing the residence streets into two roadways with a parked space at the middle. The two roadways are connected every 200 feet.

The roadways are each 24 feet wide and are sloped from the parked space toward the curb and gutter along both sides of the street. The parked space along the center is retained by a continuous curb, extending 6 inches



PEDIMENT OF MADISON SQUARE PRESBYTERIAN CHURCH, NEW YORK CITY.  
Showing new panel executed in polychrome terra cotta by the Atlantic Terra Cotta Company.

an oil painting representing a restored version of the Temple of Luxor at sunrise. The first and second floor plans indicate clearly the accommodations provided. The building cost \$7.44 per square foot of area covered, and 17½ cents per cubic foot. The photos used in illustrating this Temple have been copyrighted by the Colorado Springs Masonic Building Society.

### THE IMPROVEMENT OF WIDE STREETS IN SALT LAKE CITY.

THE standard width of residence streets in Salt Lake City is 132 feet from lot line to lot line, and 60 to 92 feet from curb to curb. As a result, the cost of pav-

above the surface of the pavement. The space between the two parallel curbs along the sides of the parking is filled to the top of these curbs and carefully maintained as a lawn. The cost of this maintenance is borne partially by the property owners along the street improved and partially by the city.

In all, eight blocks of residence streets have been improved in this manner during the last three or four years. The appearance of the streets on which the parking has been placed is so greatly improved as to enhance considerably the abutting property. The latter bears the expense of the improvement, except at the street intersections, which are paid for by the city. — *Engineering Record*.

## CLEANING BRICK FRONTS.

**A**N EXPERT in the sand-blasting trade who has operated on many buildings, on being asked as to the efficiency of the sand-blast upon soiled brickwork, said that he could not advise it except when the brick were extremely hard. When used against stone the blast does not remove the original face, he said, "only the grime." But in the case of brick, not extremely hard, the result might be different.

The force with which sharp sand can be driven through a fine nozzle is very great. If permitted it would quickly cut a stone in two. In the case of granite, marble and cut stone the skilful operator preserves the original face of the block, but he cannot guarantee to do so with respect to all sorts of front brick. He advises cleaning front brick with acid instead of sand-blasting. The same opinion seems to be held abroad. The cleaning of brick fronts was the interesting subject of a paper recently read before the German Association of Brick and Terra Cotta Manufacturers. The author protested against the use of sand-blast or other method by which the original face of the brick would be taken away, saying:

"When the blast is used, and the face of the brick taken off, the cleaned front will show a good appearance only for a short time, as the brick with the original face removed will be very much more porous than before, and absorb dirt more readily. The use of steel brushes is also very bad, and will not give a first-class job. The best method is cleaning the brick fronts with a solution of muriatic acid. The strength of the solution can be made to 1 in 12. When this solution is too strong for the brick, acetic acid should be used. A good soap solution will, as a rule, take off all thick dirt, and the cleaning with acid solution can then be done easily."

**D**ES MOINES has been carrying insurance upon its school buildings at a premium cost of about \$5,000 per year for a period of ten years. Within this time the fire losses to the companies have been but \$1,400. Meantime the school buildings have been greatly improved in the matter of protection



DETAIL BY HOPPIN & KOEN,  
ARCHITECTS.  
New Jersey Terra Cotta Company, Makers.

against fire. The school board has just been considering the advisability of abandoning the private companies and having the city itself assume the risk. Many of the largest property owners favored this course; but the board voted three to two in favor of continuing the insurance to the amount of forty per cent of the appraised value of the buildings. The minority favored abandonment of all insurance without compromise, and they have on their side the principle which is the buttress of the insurance business. A fire insurance company is but an association of persons maintained to distribute among all of them the chance losses to which all are exposed, but which actually fall upon a few; and so a city, carrying its own insurance on public buildings, is virtually an association for distributing among all citizens the chance losses caused by fire of a comparatively small fraction of their common property.

## THE RECONSTRUCTION OF THE ERECHTHEION.

**W**ITHIN the last few years a partial reconstruction of the Erechtheion, on the Acropolis at Athens, has been in progress. An elaborate study of the stones strewn around the building, a sorting-out of them, and the replacement of them, one by one, in the walls of the fabric, has produced an astonishing result. It has rendered necessary a considerable readjustment of previous conceptions with regard to the original form and character of the Erechtheion.

The technical direction of the reconstruction has been in the hands of M. Balanos, the architect and engineer attached to the Ministry of Education. The north portico has been restored, the west wall built up, and the celebrated caryatid porch on the south front renovated.

The original cornice and architrave blocks of the south porch have been restored, as well as fragments of the podium, while, of the caryatid figures, the one next the entrance is chiefly a restoration, in marble, made in 1846, when the portico was in danger of falling, and another is a terra-cotta copy intended to replace the one removed in 1804. — *The Architectural Review*, London.



DETAIL OF CORNER ENTRANCE TO BANK BUILDING.  
Northwestern Terra Cotta Company, Makers.  
Diboll, Owen & Goldstein, Architects.

**O**NE of the novel features included in the splendid array of Japanese exhibits that will be seen

this year, at the White City, London (Eng.), famous exposition center, will be an immense model of the entire city of Osaka, the Venice of Japan, which will contain the tiny reproductions of some 300,000 houses and hundreds of bridges, and a model of the beautiful temple in Shiba Park, Tokio.

**T**HE oldest temple in the world, so far discovered, says an

exchange, has been unearthed by excavators at Bisya, in central Babylonia. The walls of the tower were first uncovered and the summit cleared. The first inscription on the surface was on a brick stamped with the name Dungi, which goes back to 2750 B.C. A little lower appeared a crumbled piece of gold with the name Param Sim, who lived in 3770 B.C. Just below were large square bricks peculiar to the reign of Sargon, 3800 B.C., who was probably the first Semitic king of Babylon. A large platform was discovered 2½ yards below the surface, which was constructed of peculiar convex bricks such as were used in building 4500 B.C.

#### THE VENICE CAMPANILE.

**I**T WAS hoped that the old Campanile of St. Mark's at Venice, which collapsed on July 14, 1902, after an existence of 1,014 years, would have been completely replaced by Easter of the present year. There was, however, no possibility of the work being finished at that time, but it is confidently expected that the bell of St. Marco will again ring out on St. Mark's Day, April 25, 1911. The intention is to reproduce the old tower as faithfully as possible, and with that object in view the bricks, of which there are about one million, have been specially selected and laid. The bricks are each 12 inches long, 6 inches wide, and 3 inches deep. The clay is twice mixed to secure homogeneity. These bricks contain salt, which threatens to turn the tower



ENTRANCE TO CLEVELAND BASEBALL PARK, CLEVELAND, OHIO.  
Watterson & Schneider, Architects.

by 36 windows. In the new tower the shafts are bound together by iron rods, and the pilasters at the angles of the inner shaft are similarly united.



STORE BUILDING, CLEVELAND, OHIO.  
Bohnard & Parsson, Architects.

white. An outcry was raised, and the work was suspended while an inquiry was held. It was found that by prolonged soaking in water the salt was removed. The shaft which was completed four months ago, is composed of an inner and an outer shaft, between which mounts the inclined plane which leads to the bell chamber. The walls of the outer shaft are 6 feet thick. The inclined plane is lit

#### BUILDING OPERATIONS FOR JUNE.

**O**FFICIAL reports from forty-five cities throughout the country compiled by *The American Contractor*, New York, show a gain of 2 per cent in the aggregate, in building operations as compared with June, 1909. Seventeen cities show a loss of from 1 to 64 per cent, and twenty-eight show a gain of from 2 to 264 per cent. The cities scoring a gain of 50 per cent or over are: Atlanta, 67; Birmingham, 54; Cincinnati, 61; Denver, 67; Detroit, 109; Hartford, 115; Little Rock, 118; Manchester, 63; Memphis, 70; New Haven, 169; Oklahoma City, 264; Portland, Ore., 83; Scranton, 72; Syracuse, 53.

#### A GOOD WORD FOR BRICKS.

**I**N UNCOVERING the fine stone bridge over the moat at Hampton Court Palace, England, some interesting discoveries have been made. In the wall of the north wing two large archways have been revealed, evidently designed to bring the water into the moat; and on the south side have been found some curious brick steps leading by an archway into the moat from a subterranean way. There is much which points to the waters of the moat having been utilized to flush the vast system of arterial drainage



which was one of the main features of this palace. The brickwork of both the moat wall and the main building, though buried for two hundred years, has mostly been found in as satisfactory a state as the stonework of the bridge. Where it was otherwise, it has been carefully patched with the old Tudor bricks. Tens of thousands of these—unrivalled for their texture and their varied tones of rich color, extending from dark purples and crimsons to bright rose—have been collected from the *débris* and put aside for the restoration.

#### THE NEW PEDIMENT PANEL IN DR. PARKHURST'S MADISON SQUARE CHURCH.

OVERSHADOWED by the highest office building in the world, surrounded by modern skyscrapers, situated near one of the busiest, most varied, and interesting districts in New York, one cannot fail to notice and consider the Madison Square Church.

Undoubtedly, in designing this church, the architects, McKim, Mead and White, deliberately set out to make it fitting and harmonious for a church, yet unique enough to command attention in a commercial district, rather than to fade insignificantly into the background by conforming strictly to convention.

The difficulties of the problem were enhanced doubly by the facts that size must be insignificant in comparison with the buildings which were, or would be, erected in the immediate vicinity, and that open space to set off the church by contrast was entirely lacking. Brilliance and variety of color, combined with unique design, solved the problem.

Polychrome Terra



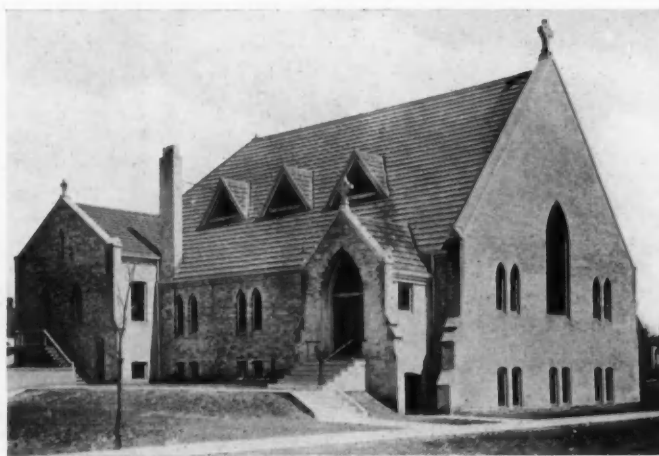
HIGH SCHOOL, WATERTOWN, N. Y.

The round and square columns are built of brick. Brick furnished by the Iron-clay Brick Company.  
J. W. Griffin, Architect.



DETAIL BY CROW, LEWIS & WICKENHOEFER, ARCHITECTS.

Made by Conkling-Armstrong Terra Cotta Company.



WOODLAWN CHURCH, CHICAGO, ILL.

Roofed with German tile made by the Ludowici-Celadon Company.  
Arthur Peabody, Architect.

Cotta was immediately chosen for all the colored features, with the exception of the green marble columns. It was, in fact, the only material in which the desired result could be obtained in a lasting, artistic, solid—but not too massive—way. Terra cotta admitted the defining of various members of ornament in different colors on one piece and so maintained the solid impression necessary in a structural material. Paint, of course, was out of the question. Colored stone or marble was

because the natural colors do not occur with enough tone and life, and combining the colors would necessitate very small pieces and consequently an undesirable mosaic effect.

The use of Architectural Terra Cotta was in no sense an experiment, but it was the first important instance of the use of Polychrome Terra Cotta in this country. In fact, colored faience had been practically a lost art since the days of the Della Robbias and was just beginning to be revived at the time the church was erected. For that reason, what to-day seems an excess of caution, was used. The colors were not applied boldly enough, and cut up and divided by the ornament gave from any distance but little more effect than monotone. Fortunately, the dominant feature, the pediment, was left a blank wall until this spring, when the rapid development of Polychrome Terra Cotta—given its first impetus by its use on the minor members of the church—enabled the architects to use it for the pediment in what was undoubtedly the ideal way. The result is that the whole scheme is unified and emphasized and the building has attained a distinct and distinctive character—unique, but ecclesiastic.

Worship at the Shrine of Truth is the subject



of the sculptured panel. The central feature is naturally the universal Christian symbol, the Cross, in gold. Worship is typified by the angels on either side, one bearing a lyre and the other a scroll with the inscription, "*Gloria in Excelsis Deo.*" The allegory is completed by the kneeling figures, symbolizing the Church as a Shepherd and the Church Militant.

The design is by Harry Siddons Mowbray and the modeling by Adolph A. Weinman. The figures are in bold relief, dull white against a background of light blue. The effect is brightened by a light Sienna background for the cross. The cross itself, and the stars, are in gold leaf; the white, blue, and Sienna are the terra cotta glazes and slips.

Altogether, the result is interesting and attractive—a decided relief to the American eye, too used to dull monotony in architecture.

**J**OHAN H. PRAY & SONS CO., of Boston have just completed tests to determine the action of acids upon linoleum.

The increasing interest and use of linoleum as floor covering on cement foundation, render the results of these tests interesting in connection with buildings for laboratories, medical institutions, etc.

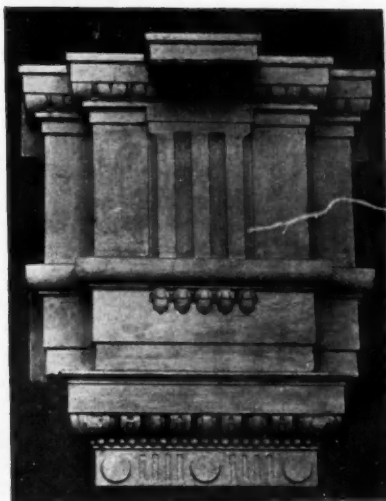
A strip of linoleum was submitted to the action of the following acids, both concentrated and dilute: Nitric,  $\text{HNO}_3$ , sulphuric,  $\text{H}_2\text{SO}_4$ , hydrochloric,  $\text{HCl}$ , Acetic and aqua regia, a combination of nitric and  $\text{HCl}$ . The acids were left on between one and a half and two hours, and then washed off. In all instances the effect appeared to be entirely on the surface, and in some instances hardly without discoloration.

Three samples were then submitted to an acid bath of *seventy-two* hours in three different acids. In one case only, that of nitric acid, was the fabric eaten.

They also have under way tests of the product of a number of manufacturers, to discover the compound which will give the maximum of wearing value with the minimum of stretch. Some of the linoleums that are now on the market, while apparently up to standard in thickness and density, even when laid by most approved methods and skilled workmen, continue to stretch. This is an important feature, and one deserving the attention of architects and builders.

#### IN GENERAL.

Twenty-eight sets of drawings submitted in competition for the Oakland, Cal., City Hall were exhibited during the month under the auspices of the San Francisco Architectural Club in the Mechanics Institute Building at



DETAIL BY FRANKLIN & AYRES,  
ARCHITECTS.  
South Amboy Terra Cotta Company, Makers.

Chapter held its annual outing during June at Princeton, N. J., the especial object being an inspection of the new work which is being carried on at the University. Mr. Frank Miles Day accompanied the party and explained the work in progress and proposed.

The Annual Report of the Schoolhouse Department for the City of Boston for the year ending February 1, 1910, has just been published.

The Year Book of the Rhode Island Chapter of the American Institute of Architects which is just at hand contains a large number of illustrations of new work which has been executed by the architects of Providence, R. I.



DETAIL BY  
A. B. GROVES,  
ARCHITECT.  
Made by the Winkle  
Terra Cotta Company.

San Francisco. The following awards were made in the competition:

First prize design, Palmer & Hornbostel, New York City; honorary prize, Cass Gilbert, New York City; second prize designs, Bakewell & Brown, San Francisco; Arnold W. Brunner, New York City; Delano & Aldrich, New York City; J. H. Freedlander, New York City; George W. Kelham, San Francisco; H. Van Buren Magonigle, New York City; Frederick H. Meyer, San Francisco; Rankin, Kellogg & Crane, Philadelphia; Ward & Blohme, San Francisco; York & Sawyer, New York City.

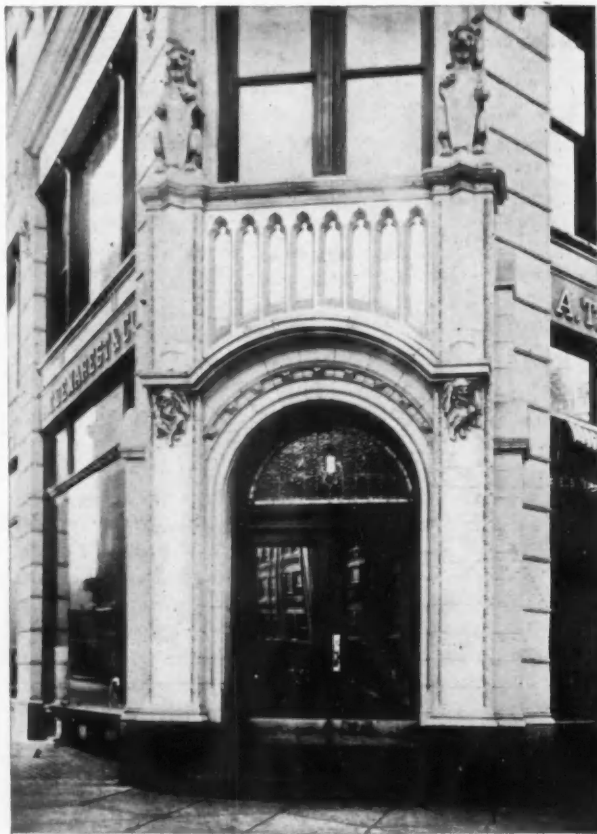
Members of the Philadelphia Chapter A. I. A., T Square Club, and the Southern Pennsylvania

Peuckert & Wunder, architects and engineers, are successors to the firm of Kurt W. Peuckert, offices 310 Chestnut street, Philadelphia, Pa.

J. Flood Walker and H. A. Reuter have associated for the practice of architecture, with offices in the Frost Building, San Antonio, Texas.

Will S. Aldrich, a graduate of Massachusetts Institute of Technology, and winner of the Rotch Traveling Scholarship and also for a number of years connected with McKim, Mead & White has formed a partnership with E. J. Eckel, F. A. I. A., and George R. Eckel of St. Joseph, Mo., under the firm name of Eckel & Aldrich. The firm has taken offices in the Corby-Forsee Building.

The Atlantic Terra Cotta Company will furnish the architectural terra cotta for the following new buildings: Parochial School and Convent, Brooklyn, N. Y., George H. Streeton, architect; Station for the Philadelphia and



MAIN ENTRANCE TO DEMAREST BUILDING, NEW YORK CITY.

Executed in cream white terra cotta by New York Architectural Terra Cotta Company.  
F. H. Kimball, Architect.

Reading Railroad, Columbia avenue, Philadelphia, William Hunter, architect; a large amount of polychrome terra cotta for the new High School Building at Norfolk, Va., Neff & Thompson, architects; Engineering Building for the University of Cincinnati, Garber & Woodward and Tietig & Lee, associated, architects.

The Western Brick Company of Danville, Ill., has purchased the plant of the Selby Brick Works at Danville, and will remodel the plant for the especial purpose of making dark colored, medium priced facing brick with glazed and matt-finish.

A series of waterproofing tests covering a period of several years have been made on the North German-Lloyd docks at Hoboken, and of all the materials used in the experiments Cabot's Waterproofing compound was found to be the most efficient. Work has now begun upon waterproofing all of the brickwork with Cabot's material.

Gladding, McBean & Co., San Francisco, have just issued an unusually attractive catalogue, illustrating and describing the full line of burnt clay wares which the Company manufactures.

#### NEW BOOK.

ESTIMATING THE COST OF BUILDINGS with important chapters on estimating the cost of building alterations,

and on system in the execution of building contracts. A systematic treatise on factors of cost and superintendence, with working citations. By Arthur W. Joslin, Building Estimator and Superintendent. Illustrated. New York, David Williams Company.

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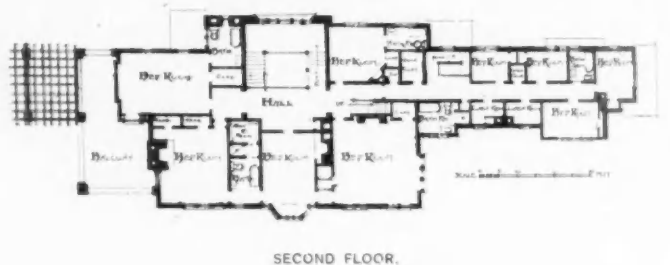
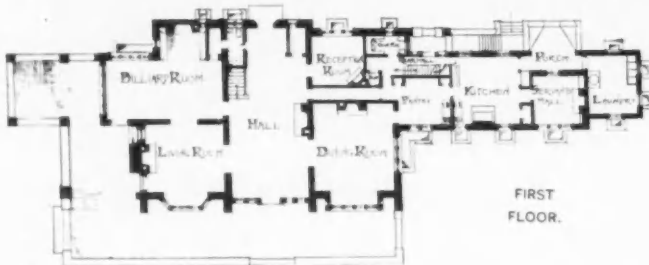
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HOUSE AT BRYN MAWR, PA.  
DUHRING, OKIE & ZIEGLER, ARCHITECTS.

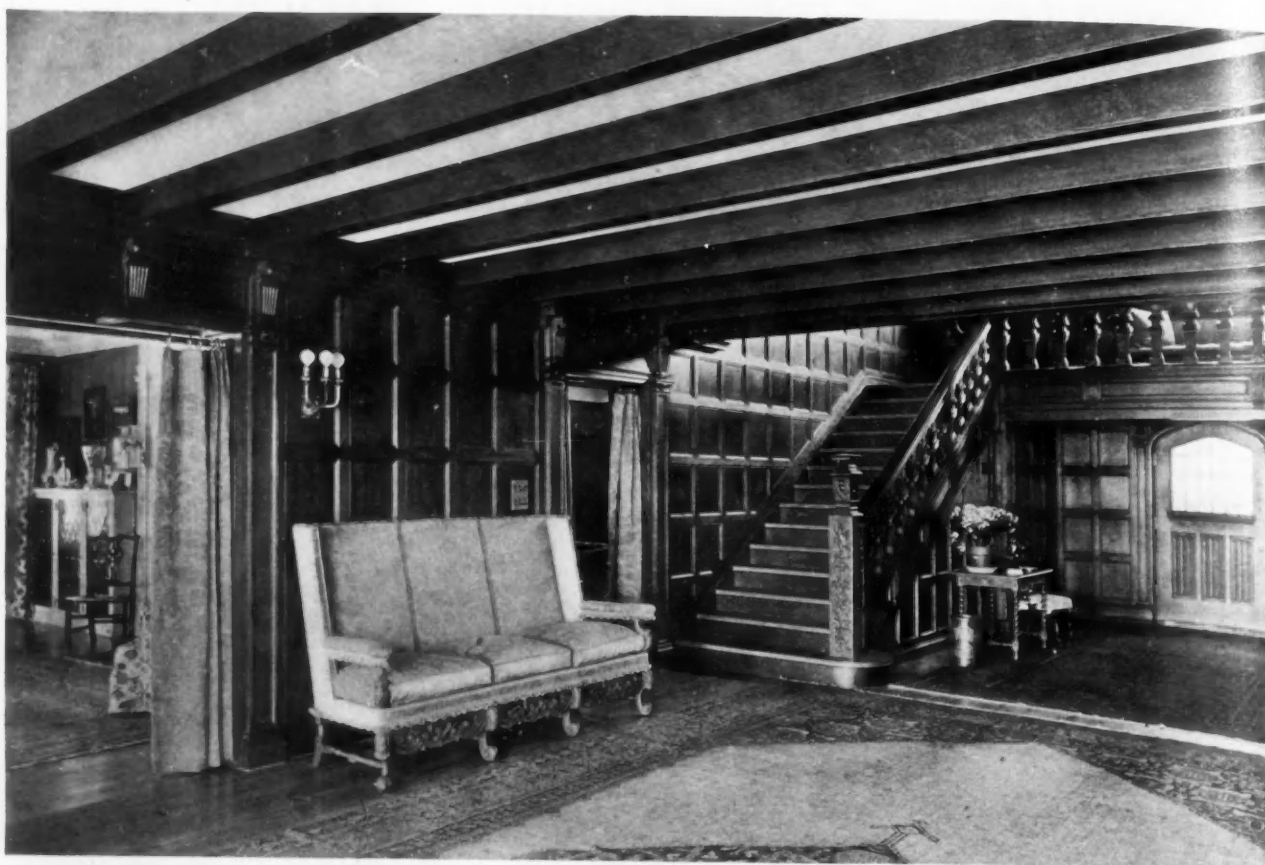




HOUSE AT BRYN MAWR, PA.  
DUHRING, OKIE & ZIEGLER, ARCHITECTS.



1941

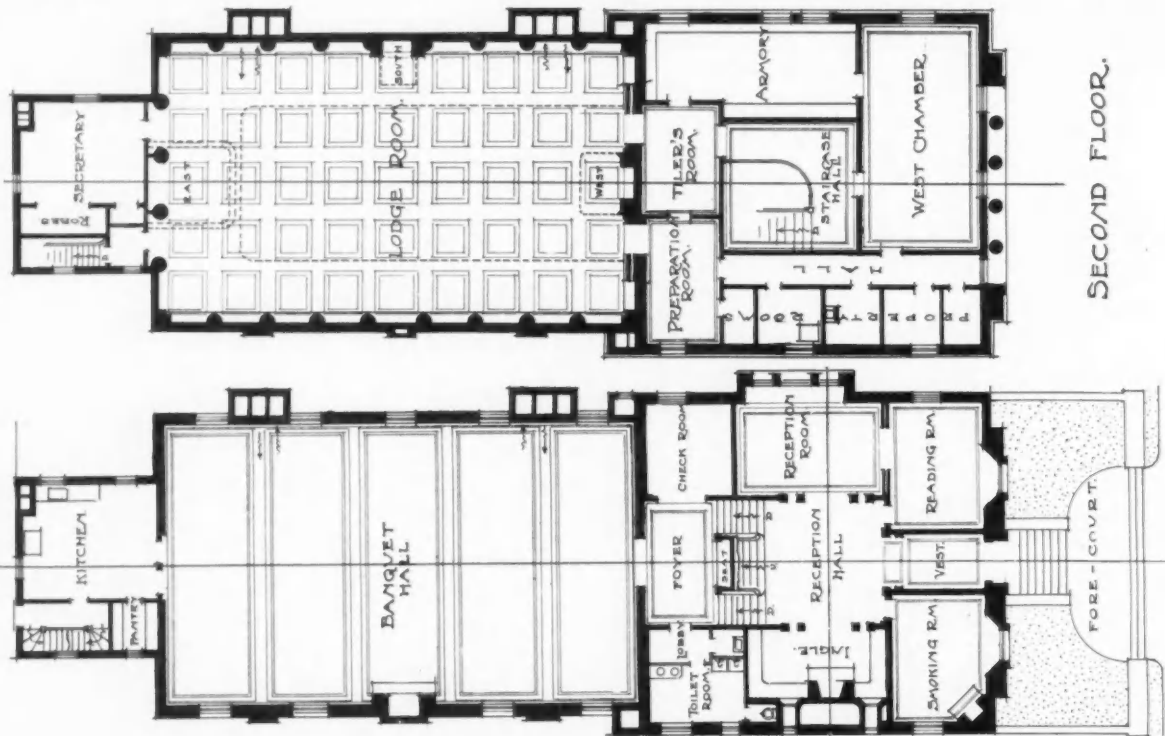


INTERIOR VIEWS.

HOUSE AT BRYN MAWR, PA.  
DUHRING, OKIE & ZIEGLER, ARCHITECTS.

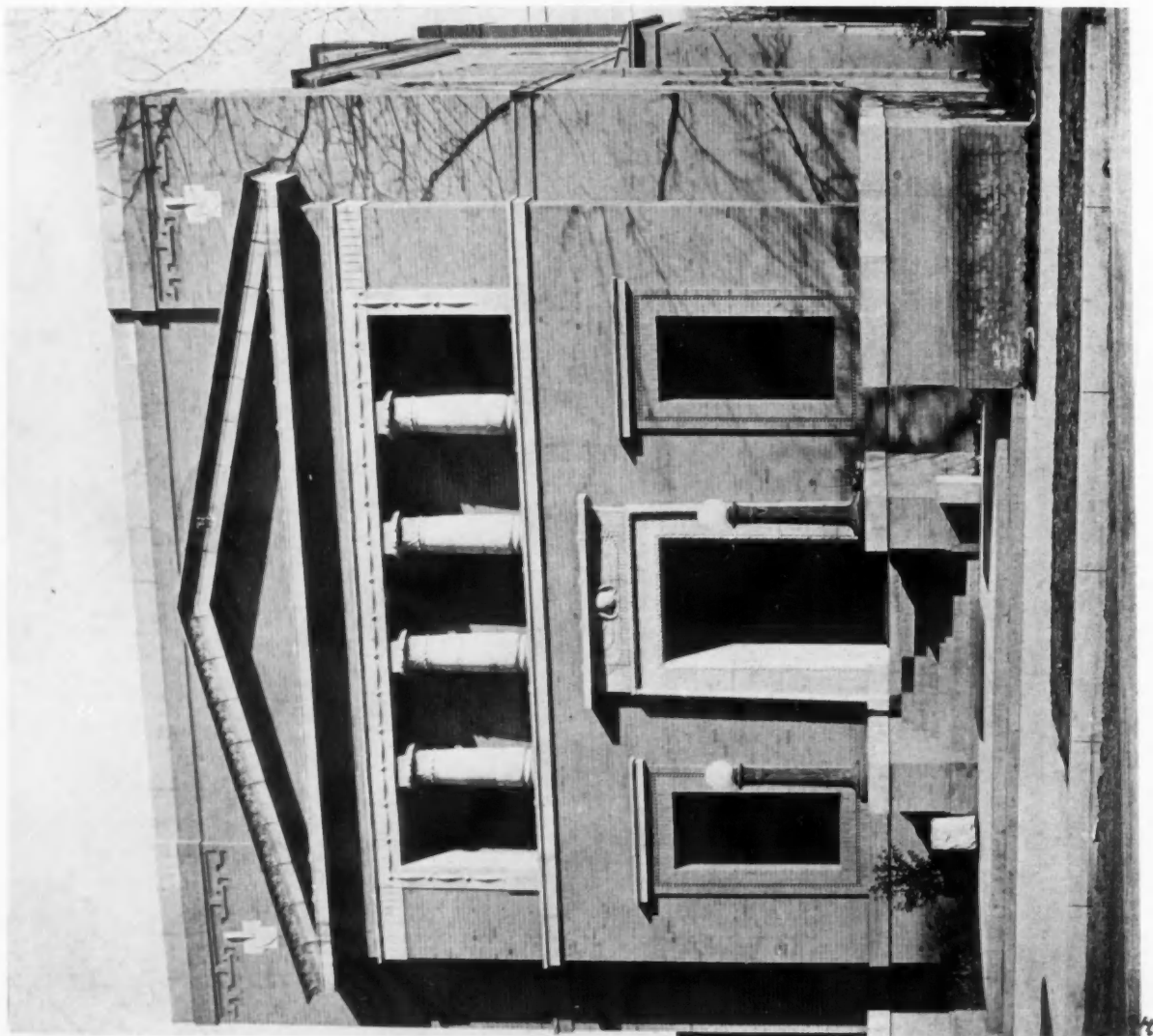






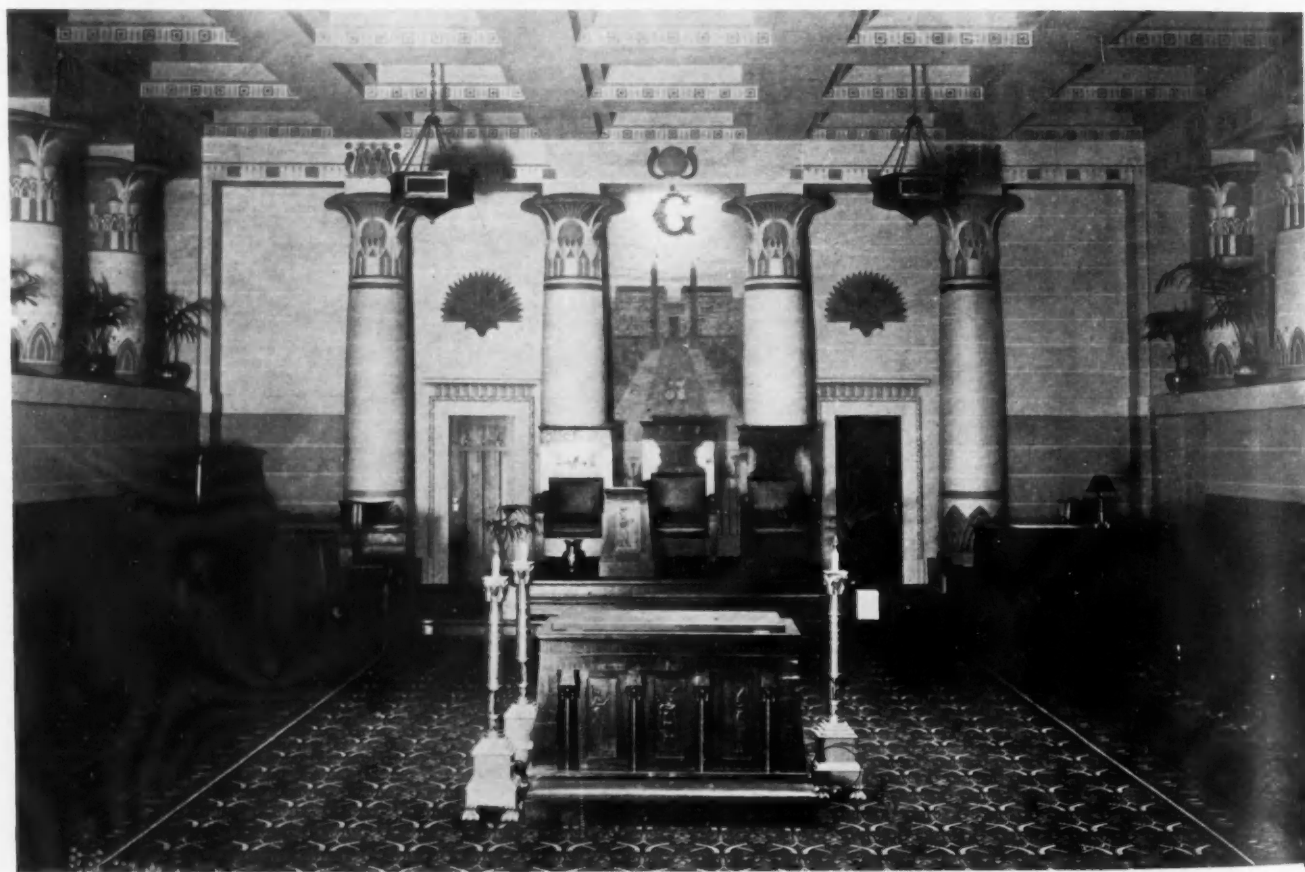
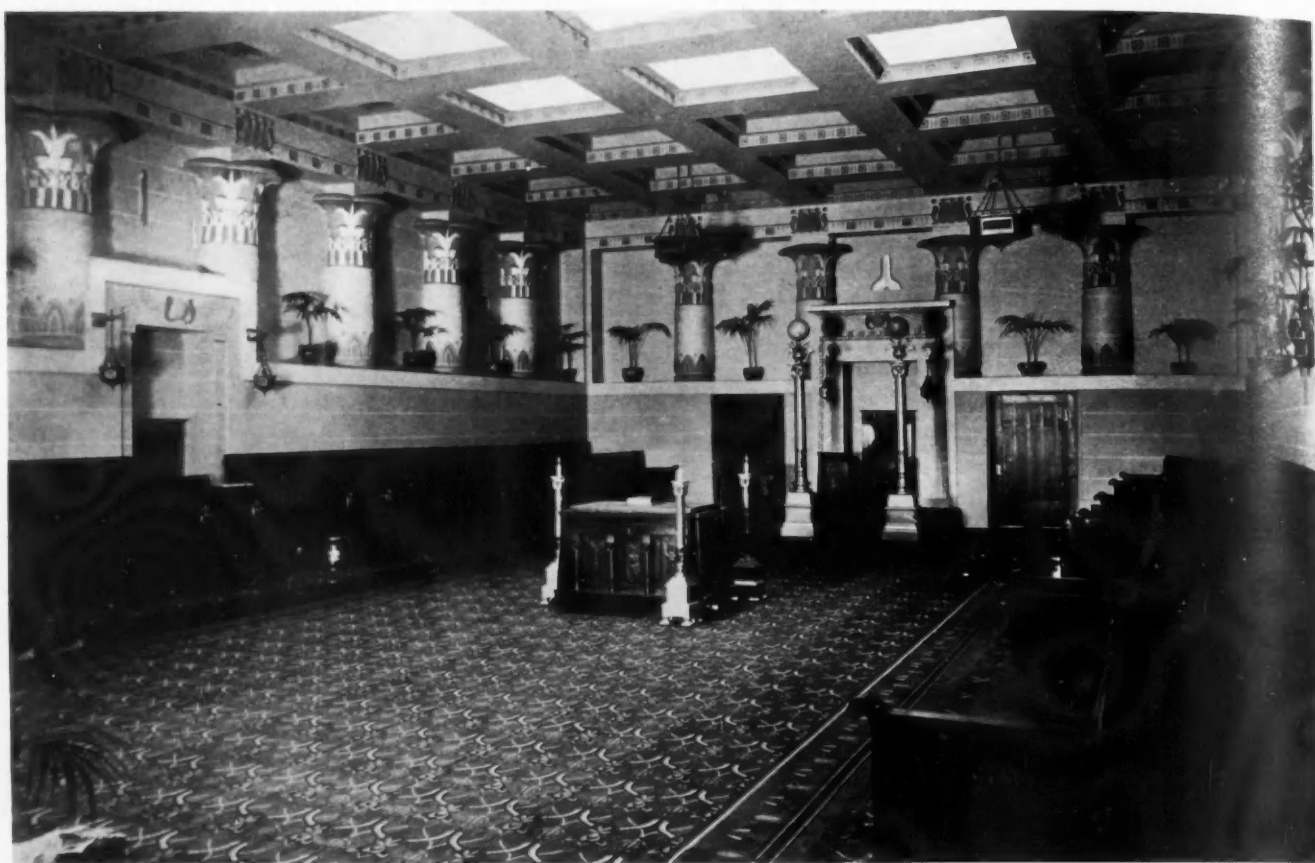
FIRST FLOOR.

SECOND FLOOR.



MASONIC TEMPLE, COLORADO SPRINGS, COLO.  
MACLAREN & THOMAS, ARCHITECTS.

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INTERIOR VIEWS.

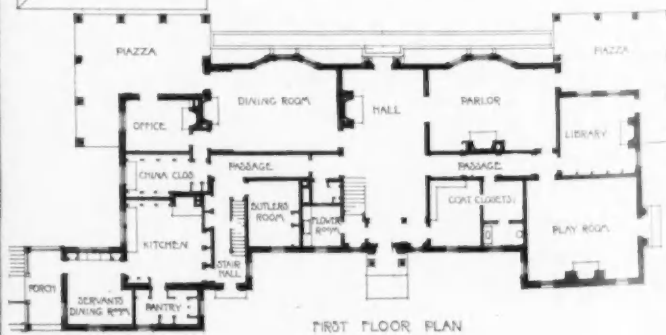
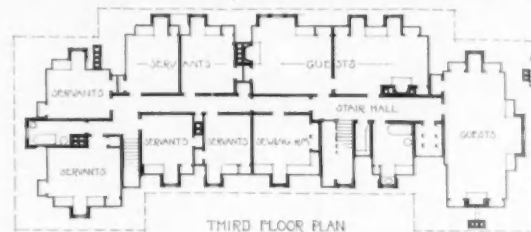
MASONIC TEMPLE, COLORADO SPRINGS, COLO.  
MACLAREN & THOMAS, ARCHITECTS.







M 70 U



HOUSE AT ROWLEY, MASS.  
WILLIAM G. RANTOUL, ARCHITECT.

UofM



HOUSE AT ROWLEY, MASS.  
WILLIAM G. RANTOUL, ARCHITECT

W. G. RANTOUL





HOUSE AT WESTWOOD, MASS.  
PARKER, THOMAS & RICE, ARCHITECTS.

24  
1910

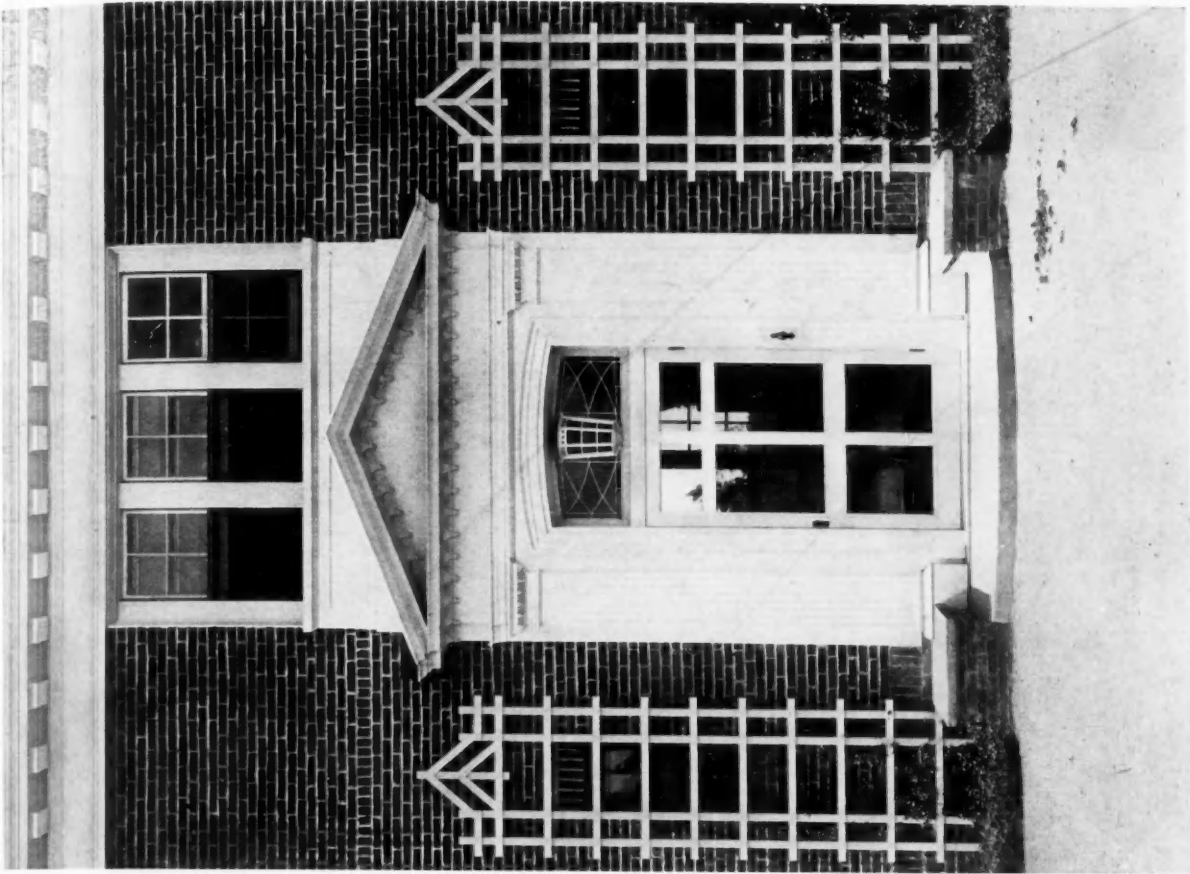
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HOUSE AT WESTWOOD, MASS.  
PARKER, THOMAS & RICE, ARCHITECTS.

M7011





DETAIL OF ENTRANCE.

HOUSE AT WESTWOOD, MASS.  
PARKER, THOMAS & RICE, ARCHITECTS.



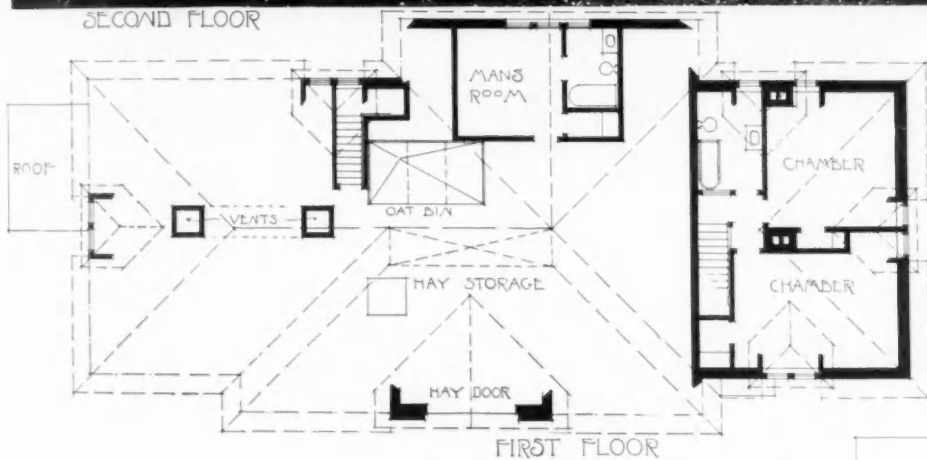
DETAIL OF PORCH.

DRINK

1064



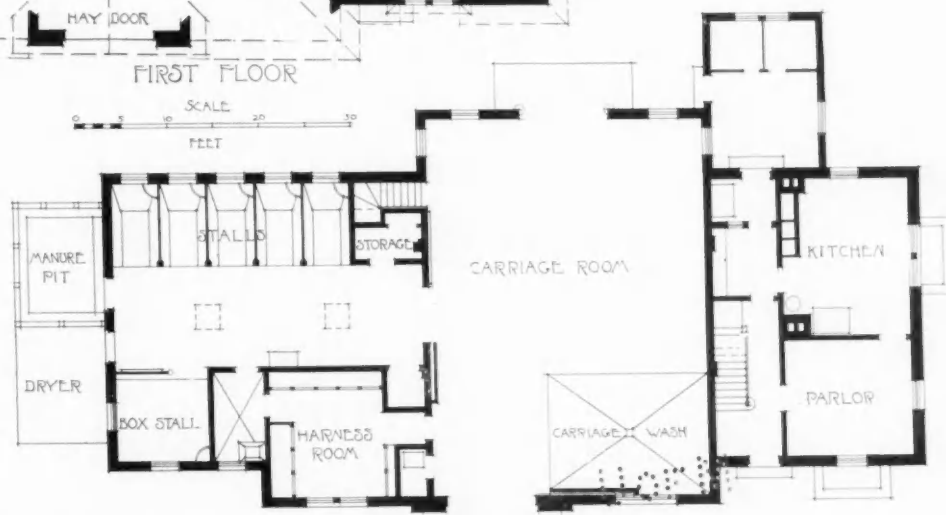
SECOND FLOOR



FIRST FLOOR

SCALE  
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FEET

STABLE  
AT  
WESTWOOD, MASS.



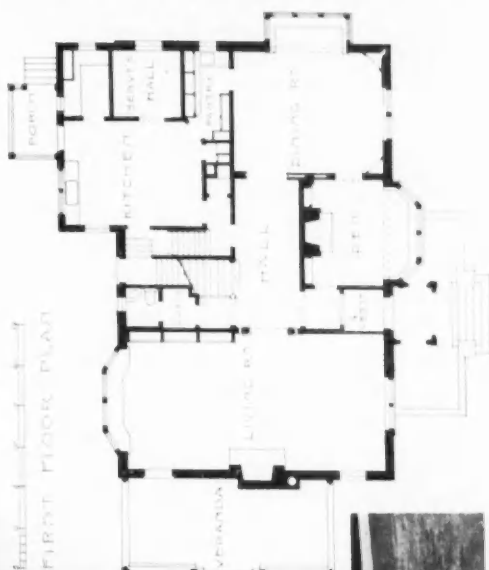
PARKER,  
THOMAS & RICE,  
ARCHITECTS

UOLM

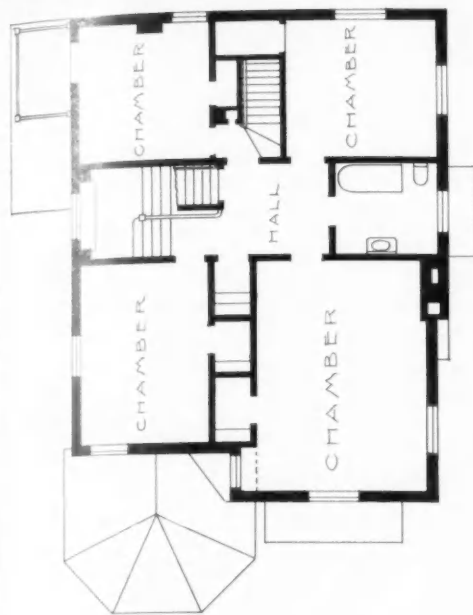




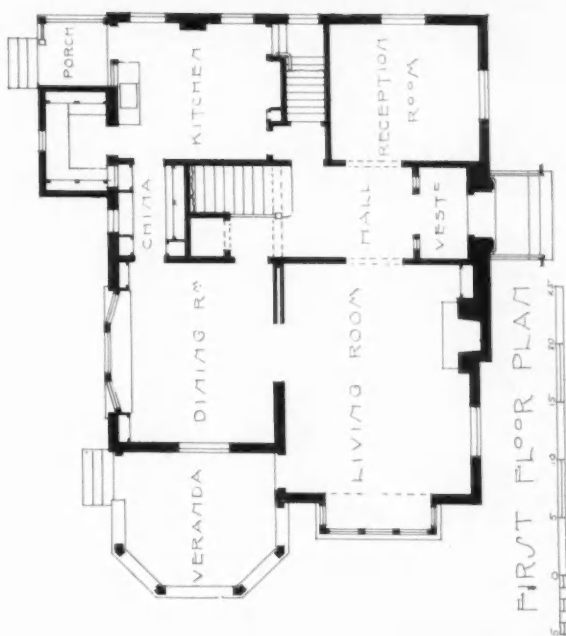
HOUSE AT  
WALKERVILLE, ONTARIO.  
ALBERT KAHN, ARCHITECT,  
ERNEST WILBY, ASSOCIATED.



1904



SECOND FLOOR PLAN



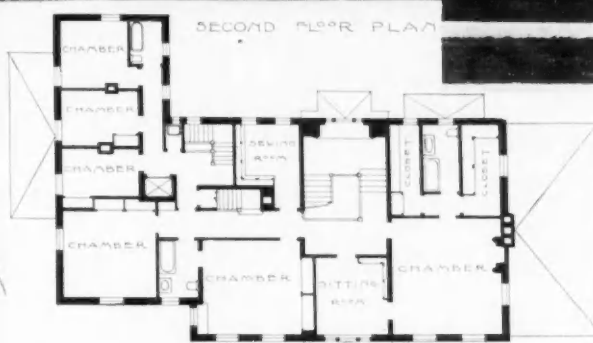
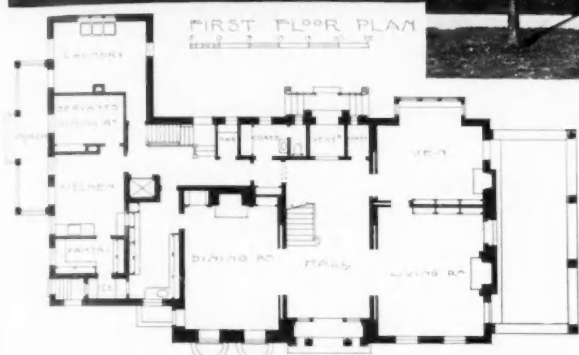
FIRST FLOOR PLAN



HOUSE AT WALKERVILLE, ONTARIO.  
ALBERT KAHN, ARCHITECT, ERNEST WILBY, ASSOCIATED.

M 70 U





HOUSE AT WALKERVILLE, ONTARIO  
ALBERT KAHN, ARCHITECT, ERNEST WILBY, ASSOCIATED.